COAL AGE

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Be A Sport!

By Berton Braley

LET'S be good sports about it. About what? About everything, business, life, work, love and play.

There isn't any better recipe for living than that, anyhow.

Because the good sport accepts life as it is, tries to make it better, takes good fortune gratefully and bad fortune bravely and never loses heart.

So let's be good sports.

Business isn't as flourishing as we wish, perhaps, but we won't improve it by grouching or by being in a blue funk. In fact, we make it worse.

Let's be decently cheerful about it and determined that it must be better.

And if enough of us feel that way, it will be better, because that's the psychology of trade.

The way the average American business man has been sitting forlornly at his desk and grumbling over hard times and the war has been a great disappointment to those of us who thought that he would go out and gather in the trade of the world while the other nations were endeavoring to obliterate each other.

There wouldn't be anything unsportsmanlike in going after that business.

If Bill Smith and Tom Jones, who have been selling potatoes to Dick Brown, suddenly mix it in the street and use up all their potatoes as weapons, Dick Brown still needs potatoes and Jim Black isn't a bum sport if he supplies Dick.

But he's a mighty bad business man if he sits by with his own wagon full of potatoes, and moans, "Oh dear, oh dear, the potato business has all gone to pieces! Look how Bill and Tom are throwing them away."

Let's stop fussing and fretting and muttering, let's wake up and perk up, play the game, go after the prize.

Let's be good sports.

Herbert Mine of the Connellsville Central Coke Company

SYNOPSIS—At a mine in the coke district of Pennsylvania the output of 700 cars was formerly hauled by 29 horses. A gasoline locomotive was installed, and the output was thereby increased to 850 cars, despite the fact that 5 horses and 3 drivers were dispensed with and the haulage distance was increased. Another locomotive has been installed to increase both the output and the efficiency of the haulage system.

The Herbert mine of the Connellsville Central Coke Co., at New Salem, on Dunlaps Creek, Fayette County, Penn., produces about 1700 tons of coal per day, and about 650 tons of coke are produced in 210 rectangular ovens, 105 of which are drawn daily. All the coal mined which is not used for making coke in the 210 rectangular ovens at Herbert is shipped a distance of two miles to the Connellsville Central Coke Co.'s "Low Phos." works and coked in the 210 beehive ovens at that plant.

HERBERT MINE OF CONNELLSVILLE CENTRAL COKE CO. AT NEW SALEM, FAYETTE COUNTY, PENN.

The mine is equipped with 386 Wolf safety lamps and is classed by the inspection department as a gaseous operation. It is ventilated by a Clifford fan, 18 ft. in diameter and 8 ft. wide. At 70 r.p.m. this fan will deliver 185,000 cu.ft. of air per min. It is driven by direct-connected Porter-Allen engines. The power plant is equipped with two 100-kw. 250-volt direct-current Westinghouse generators direct-connected to Ball engines. The air for two Sullivan and eight Ingersoll coal punchers is compressed in two 24&14½x22x24-in. Norwalk air compressors of 1380 cu.ft. per min. capacity compressing the air to 100 lb. pressure.

The boiler plant is equipped with six Phoenix and two Titusville boilers having an aggregate output of 1200 hp. The hoisting engine was manufactured by the Vulcan Iron Works and has cylinders 24 in. in diameter with 48-in. stroke. The hoisting drum measures 8x10 ft. and operates self-dumping cages.

The steel tipple was built by the Fort Pitt Bridge Works, of Pittsburgh, Penn. It has a capacity of 2000 tons per 9-hr. day. Everywhere the equipment is substantial. The offices and the commissary form together a large two-story building 48 ft. wide and 76 ft. long.

The Former Haulage System

With this equipment the haulage system was strangely in contrast. Twenty-nine horses hauled the output of 700 cars, to the haulage rope or to the shaft bottom as the case might be. The coal from some of the flats was handled independently of the haulage rope. This represented a net tonnage of only 41.5 tons per horse, the tonnage per unit being low, not only because of the excessive length of haul, but because of the heavy grades. These averaged 6.5 per cent. in the butt headings. The situation evidently needed corrective treatment.

The mine was by no means small, each of the flats being as extensive as small mines in themselves with most of the coal being drawn in retreat from the boundary lines of the property. The early operations had consisted of heading and room driving, the rooms being only about 12 ft. wide and being spaced at 80-ft. centers.

The main haulage is supplied by a 24x36-in. first-motion single-drum Vulcan haulage engine which handles 24-car trips from the various flats. The rope runs up the manway and down the main road.

Four hundred mine wagons are used in hauling the coal. These are of 44-in. track gage and have a capacity of approximately 4000 lb. per car. The cars weigh when empty about 2000 lb. As the daily output is 1700 tons, it is about twice the capacity of the mine cars.

On all main haulageways 40-lb. rail is used, and on the flats and subsidiary butts the rails weigh 25 lb. per yd. The joints are all fishplated, and the track is well ballasted and carefully graded.

To increase the output, John C. Neff, the general manager, purchased a gasoline locomotive, a 5-ton machine

of that type having been successfully operated in a mine under his direction at Crucible, 2 mi. north of Rice's Landing, Greene County, on the west bank of the Monongahela River.

That locomotive had given complete satisfaction. Writing to the editor in reply to an inquiry on Oct. 19, 1914, Mr. Neff stated that the gasoline locomotive "is a great revelation in the economic haulage and safe operation of mines wherever the grades permit it to be worked." He also stated that the locomotive had done more than had been claimed for it and had exceeded his expectations.

There were some special reasons in favor of the gasoline locomotive at the Herbert mine, but its adoption was not based so much on these special conditions as on the excellent performance of the locomotive at Crucible. At the Herbert mine the introduction of electric mine locomotives would have involved increasing the power plant, wiring the mine and bonding the rails. This would have been more expensive than purchasing gasoline locomotives. The purchase and installation of compressed-air locomotives would have been a still larger investment.

Furthermore, had electric locomotives been used it probably would have been necessary to change the ventilation so that the haulage could be conducted on intake air. It had been customary to use the return for a haulageway, and this is the plan under which the gasoline locomotive gives the best results.

The headings are nowhere less than 6 ft. high and are usually higher. In these roadways of course the gas is not allowed to gather, but if it should, it would be unlikely to descend to the level of the locomotive. An electric locomotive discharges sparks liberally near the roof, and if there is any gas to ignite it can hardly fail to set that gas on fire. But for ignition to occur with a gasoline locomotive the gas must be found near the level of the cylinders and the whole roadway must be in a most dangerous condition.

Relative Safety of Gasoline Engine

The danger of gas ignition has been safeguarded by every known method in the design and building of the gasoline locomotive, installed in the Herbert mine. Of course every locomotive will make sparks when starting on a sanded rail or when the brake is operated, but apart from this risk these gasoline locomotives are not likely to set fire to gas even when present in dangerous quantities.

The exhaust would of course constitute a danger, but in this locomotive it is carried direct from the engine to a deodorizing tank, which at the option of the mine inspector can be run empty or filled with water. If the inspector considers that the mine is very gaseous and operation is dangerous, this deodorizing tank can be filled with water, and thus the exhaust from the engine can be prevented from reaching the atmosphere till it has been cleaned by a water bath. Thus all carbon is eliminated and no flame can possibly issue from the exhaust.

The fact that the mine was not new had no bearing on the decision to install a gasoline locomotive, though the older a mine the more forcibly is the purchase of such equipment indicated. The narrowing area to be mined and the great expense of installation of any system needing to be supplied with power from the power house, all argue for detached units such as gasoline locomotives. But as stated, the choice was not made owing to these facts, for at the Crucible Fuel Co.'s plant the area to be mined is 4500 acres and the plant was entirely new, yet the gasoline locomotive was introduced. Had the manager preferred some other form of haulage, it could have been readily installed.

The gasoline locomotive selected was manufactured, like that in operation at the Crucible Fuel Co.'s plant, by the Milwaukee Locomotive Manufacturing Co. The first supplied was a 5-ton machine which was shipped to the mine Sept. 29, 1914. It pulls 15-car trips in No. 5 flat right and 20-car trips in F flat on the left, the latter being a one-way haul of approximately 2000 ft. and the other being roughly half that length. The cars are delivered to the rope at the main butt entry.

Grades Partly Against the Load

The grades on both headings are partly in favor and partly against the load. Thus in the No. 5 flat there is a grade which averages 1¾ per cent. against the load extending for the whole distance between two of the butt entries, and in F flat there is a grade averaging about 1.2 per cent. against the load and nearly 1200 ft. long. It is easy to see that conditions more favorable might have been chosen. The operating expenses are as follows:

HEADFRAME, BOILER, POWER HOUSE AND STORAGE BIN AT HERBERT MINE

Locomotive runner per 9-hr. day	$2.75
Trip-rider per 9-hr. day	2.60
11 gal. of gasoline at 12c. per gal.	1.32
¼ gal. lubricating oil at 22c. per gal.	.06
Cup grease, waste, oil, etc.	.05
Total	$6.78

The results obtained from this locomotive were so satisfactory that a duplicate was purchased and shipped to the mine, Jan. 28, 1915. The locomotive is working in C flat on a haul which measures one way 2700 ft. and in D flat where the haul is 3000 ft. one way. Both flats have grades favorable to the load. However, in D flat is a grade about 300 ft. long which runs about 1.1 per cent. against the load. At present each of these locomotives is hauling about 250 loaded cars per day, and handling about 500 tons. It is expected that when certain grades are made more even and when delays are eliminated 300 wagons loaded with 600 tons will be handled by each unit.

For the months of April and May, 1915, the locomotive in F flat and No. 5 right averaged 260 wagons daily, and

on this basis the comparative haulage costs per day are as follows:

COMPARATIVE HAULAGE COSTS

Horse haulage:		
11 drivers at $2.60		$28.60
Feeding 11 horses at 50c		5.50
		$34.10
Motor haulage:		
6 drivers at $2.60	$15.60	
Feeding 6 horses at 50c	3.00	
1 motorman	2.75	
1 snapper	2.60	
Gasoline, oil, grease, etc	1.51	
		25.46
Saving per day accomplished by use of gasoline motor		$8.64

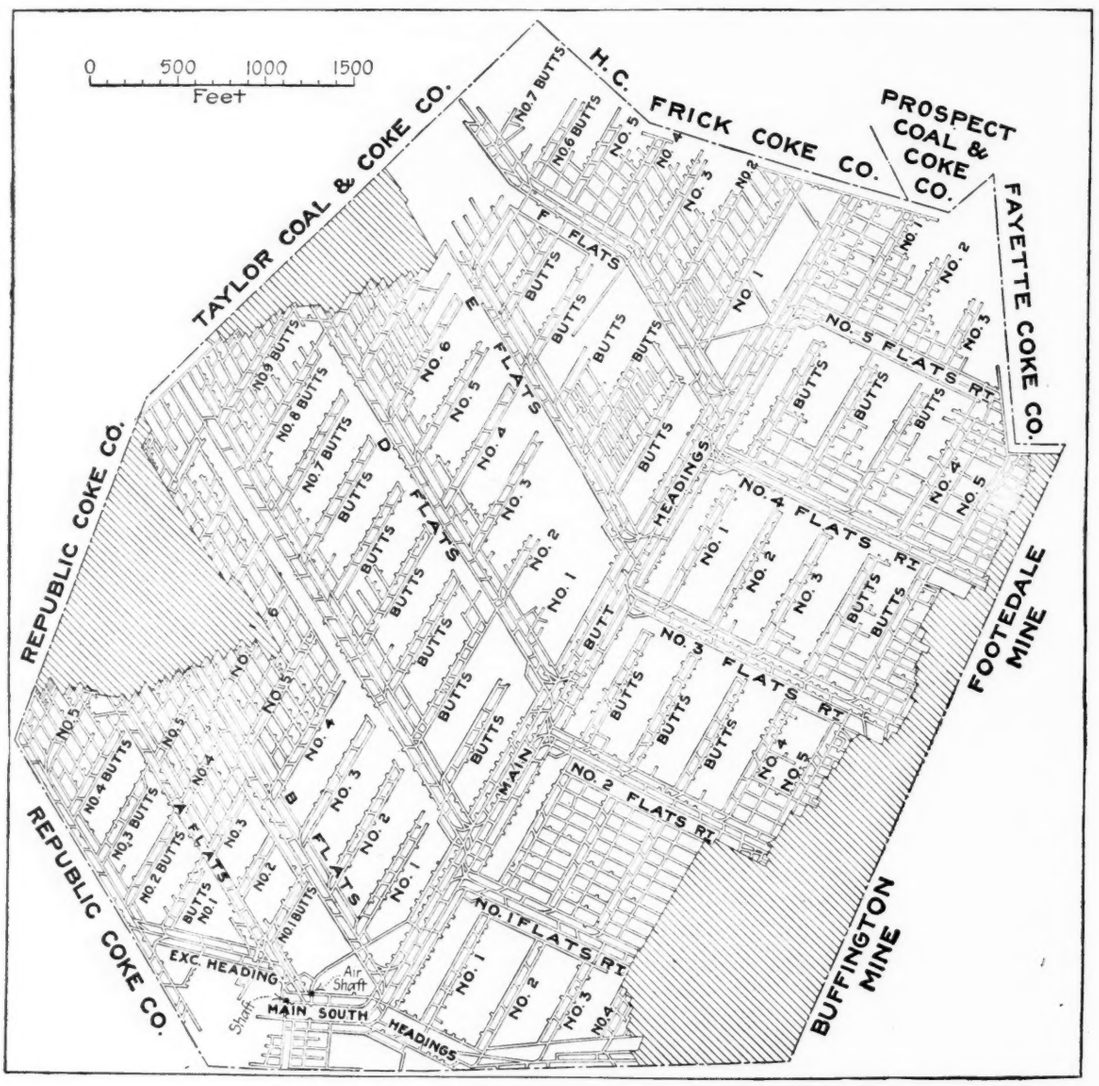
The locomotives when fully equipped weigh 10,500 lb. Overall they are 144 in. long, 55 in. wide and 46 in. high. Their wheels are 18 in. in diameter. The frame is of the open-bar steel type with deep face and steel end sills and with four coupler pockets on each sill. These pockets measure 7½, 10¾, 14¼ and 18 in. from the top of the rail to the pocket centers.

The locomotives are each equipped with 5x6-in. four-cylinder four-cycle engines of the vertical type, specially designed for mine-locomotive service and capable of delivering 25 hp. to the wheels at 800 r.p.m.

The engine is over the front axle, away from the operator, and drives a two-speed transmission direct through a universal coupling. Both the upper and lower sections of the engine crankcase are particularly massive in design and so constructed as to provide ease of access for the inspection and adjustment of the connecting rods and crankshaft bearings.

The transmission drives the rear axle through spur gears and is equipped with two friction clutches—one for forward and one for backward travel.

An electric generator provides current for both the ignition and lighting system, and is driven by a cross-shaft on the gear end of the engine, which permits it to be placed in a readily accessible position. A storage battery furnishes the current for the lighting system when the engine speed is low, and also supplies current for starting the engine. The voltmeter and fuse box with fuses for the protection of the headlights, together with a switch for controlling their operation, are conveniently located on the operator's end plate. The headlights, one at either end of the locomotive, are inclosed in cast-iron cases to protect them from injury, and a plug connection with an extension cord for an operator's trouble lamp is also provided.

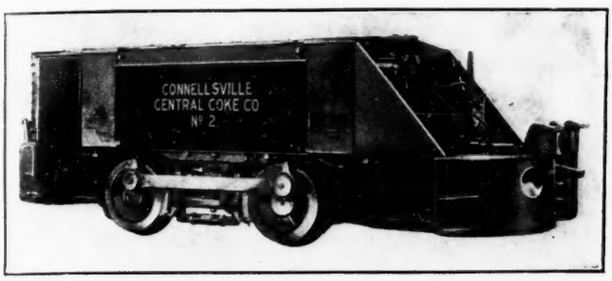


UNDERGROUND OPERATIONS OF CONNELLSVILLE CENTRAL COKE CO.

The cooling system consists of a radiator of special design and rugged construction and a conveniently located centrifugal water pump by means of which the water is kept in circulation and effectively cooled.

A detachable ratchet lever provides means for starting the engine. A safety starting device is also provided and is so designed as to protect the operator when cranking the engine in case of accidental backfire. This device consists of heavy pawls which engage in the rim of the flywheel and are automatically thrown into engagement when the operator throws in the starting crank. With this device, it is impossible to crank the engine without having the safety device engaged, and therefore no accidental backfire can cause any harm to the operator.

The special features in the construction of the locomotive are its open bar steel frame; its steel end sills; a four-cylinder vertical engine weighing 1800 lb. specially



TYPE OF GASOLINE LOCOMOTIVE INSTALLED AT HERBERT MINE

designed and built for this service; electric headlights and operator's lamp, with Edison storage battery and a heavy and reliable type of generator so constructed and arranged that lights are operated under all conditions, not only when the locomotive is in operation, but when the engine is running and the machine standing idle, and also when the engine is entirely shut off; a deodorizing tank embodied in the end sill of the locomotive by which the exhaust gases are neutralized; the safety cranking device whereby the operator is effectively protected against back kicks; a radiating system so efficient that these machines can be operated for three or four days at a time with a loss of not to exceed 1 qt. of water; gear and side-rod drive throughout, not a chain being used for power transmission. All the bearings and working parts of the locomotive are of exceptionally heavy and rugged construction and were especially designed for mine service.

Extracts from a Superintendent's Diary

For several months past we have had only enough demand for our coal to provide our men four days' work each week. On the two idle days they have wandered around like the Lost Tribes of Israel—now at the commissary, next at the railroad depot, then at a game of quoits or marbles at the ball grounds. Some have tried their hand at ball playing, but outside of the regular ball team very few of the men get much pleasure out of base ball, except when they are allowed to act as spectators. For the benefit of that crowd our regular team made strenuous efforts to get up a game with some of our rival neighbors, but the idle days at the different camps seem always to criss-cross.

Some of the men with gardens in their back yards have stuck around home mostly, and some of the others have hung around home pretty much also, much to the disgust of their wives, who would rather have them at work, especially since they grumble so much about the troubles they are going to have making ends meet.

I have been keeping pretty close tab on the doings of the men during the idle days and have come to realize more and more the necessity of devising some plan to furnish them work or amusement to keep their minds occupied while out of the mines. I have considered every suggestion that anyone has been kind enough to offer, and I have watched closely the results my neighbors have accomplished in dealing with the same problem. Last week one of our timber contractors suggested that we might turn all of our men and mules loose in a fallow field that is on company property about one mile from our camp and convert it into a turnip patch.

As a direct result of that suggestion, today has been a day that will be remembered a long time by most of the men, women and children of our camp. Curiosity to know what the mine mules would do when harnessed to plows was sufficient inducement to bring out most of the population, and once on hand as spectators, most of them could not resist the call of the earth, but had to try their hands.

We borrowed the necessary farm implements from our timber contractors, who, as it happens, are all farmers, and with plenty of mules and labor to spare the waste acres were quickly transformed into a planted field.

It proved to be a day of great fun for all who turned out, and the fun started early and continued throughout the day. Even if the seeds refuse to sprout and not a turnip plant raises its head above the ground, no one will regret the day's toil.

The mules also seemed to enter into spirit of the affair, and in spite of the years that must have passed since most of them were taken away from the farms where they were born, led off when put into harness in front of a plow, just as if plowing was everyday work for them. This was rather disappointing to some of the small boys who had looked forward to "Maud stunts" from some of the contrary mules with reputations to sustain.

A few more days like today and we would have enough turnips in prospect to supply the entire neighborhood during the coming winter. And the best part of it is that nearly every citizen of the camp would have an interest in the returns—a regular family affair, as it were.

Wanted--An Engineer

Important and responsible mining interests wish to employ a safety and efficiency engineer who is thoroughly experienced and fully acquainted with general mining conditions in the United States. The man desired must be entirely familiar with all devices of life-saving practice such as are adapted for the prevention of accidents in and about mines.

Anyone who feels qualified to make application for this position should write to the Editor of *Coal Age,* stating briefly his experience and training in the lines designated. All applications will be kept in strictest confidence and will mmediately be submitted to the people desring such a man.

Power-House Chimneys for Steam Sizes of Anthracite

By Reginald Trautschold, M. E.*

SYNOPSIS—The draft required to burn coal may be divided into three parts—(1) that necessary to force the proper amount of air through the grates and fire bed, (2) that necessary to pull the products of combustion through the boiler, economizer and breeching to the base of the stack, and (3) that necessary to propel the gases up the stack and eject them. Much larger and higher stacks are required for buckwheat No. 3 than are necessary for pea coal.

About a hundred years ago it was not believed that anthracite coal could be burned. The first anthracite taken to Philadelphia, in 1803, defied all attempts at ignition and was finally broken up to furnish material with which to build a walk. A few years later, when Col. George Shoemaker sold a few wagon loads of it to some of the more advanced, or it might have been more ignorant, Philadelphians, warrants were issued for his arrest on the charge of taking money under false pretenses.

Today close to 100,000,000 tons of anthracite are mined in a single year, a large proportion of which is burned for power generation. So valuable has become this coal supply that only the smaller sizes can now be afforded for power purposes. Pea is about the largest size now burned under steam boilers, and within recent years even buckwheat No. 3 has become quite a common steam fuel.

Anthracite Is Burned Uneconomically

There is no question as to the ability of burning anthracite today, but there is a decided question as to whether much of the anthracite that is now consumed is burned economically or efficiently. To burn the steam sizes successfully, without the assistance of mechanical draft, requires chimneys of considerable height. The necessary stacks are far higher than any that could have been conceived a hundred years ago. The pioneers in the burning of anthracite would have considered a chimney of over 700 ft. in height, such as that of the Woolworth Building in New York City, even more of an impossibility than the burning of the supposedly incombustible material that they had been beguiled into buying.

Such a chimney is, of course, exceptional, and it is doubtful if this height record will again be equaled, except in some other skyscraper that permits such construction without unduly exorbitant cost, for the intensity of the draft secured by such a tall stack can be realized at a much lower initial cost by the installation of some kind of mechanical-draft equipment. Many power houses still depend entirely upon natural stack draft, however, and it would be little exaggeration to say that there is more money wasted in chimney construction than in any other equipment pertaining to the power house. Much of this waste cannot be avoided, it is true, but the correct design of chimneys is such an important consideration that any investigation of the subject is decidedly worth while.

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A chimney is nothing more than an inefficient type of air pump that is affected by numerous conditions over which little control can be exercised. For instance, in localities where the temperature may drop to zero in the winter and approach the 100-deg. mark in the summer, the natural stack draft would be only about one-half as great on the hot day of the year as on the coldest day of the winter season.

This peculiarity possesses an actual advantage, however, for the chimney having perforce to be proportioned for adequate capacity in the summertime can usually accommodate the extra fuel that has to be burned in the winter for heating purposes without exceeding its capacity. Nevertheless this constitutes a waste, or inefficiency, since during the greater part of the year the chimney has to be operated far below its capacity.

The intensity and direction of winds also have considerable influence on the natural stack draft, with no redeeming advantage that can be counted upon. The shape of the stack and the material of which it is constructed also affect the available draft that a chimney can create. All in all, correct chimney design is an intricate matter—one that must necessarily be based on the most trying conditions that may exist and which perforce makes every chimney an inefficient piece of equipment.

What a Chimney Must Do

The work imposed on a chimney may be divided into two kinds: (a) It must create a draft sufficient to draw the requisite quantity of air through the firebed, draw the products of combustion through the boiler, fuel economizers or other heat reclaiming equipment, and through the breeching to the base of the stack. (b) It must produce the draft necessary to carry the products of combustion up the chimney and discharge them to the air.

The first requisite is dependent upon so many variable conditions as always to be a matter of conjecture when laying out a plant. In fact, even after a plant has been in actual operation and this value becomes known for certain conditions, these conditions can never be fixed, so that the furnace draft always remains decidedly unstable.

The draft necessary to carry the exhaust gases up the chimney also depends upon unreliable conditions—climate, temperature, winds, etc.—which require differing temperatures for the gases of combustion on delivery to the stack, if the draft is to remain constant. It is no wonder, therefore, that many power-house chimneys are inefficient—inefficient in being more powerful than necessary to meet economically even the trying demands made upon them.

If the grates are kept in good operating condition, the firebed free from undue accumulation of ashes, etc., the heating surfaces of the boiler and all passages to the base of the stack clean, the intensity of draft required for drawing the products of combustion through the furnace, or the furnace draft, depends upon the kind of fuel consumed and the rate of its combustion. Ordinarily, the smaller the coal the greater the draft required. For in-

stance, considerably higher draft is required to burn buckwheat No. 3 than would be necessary to burn pea at the same rate of combustion. The increase necessary is pretty accurately known for average conditions, as is also the draft required to burn buckwheat Nos. 1 or 2 at the same rate.

The furnace draft needed to successfully burn any of the four steam sizes of anthracite may be considered as being required for two distinct operations—first, to draw the required amount of air through the grates and firebed into the combustion chamber and, second, to draw the products of combustion from the combustion chamber to the base of the stack.

The draft necessary for the first operation depends upon the size of coal consumed and upon the rate of combustion. For the second operation, the draft in the average well-designed and proportioned boiler is fairly constant at a given rate of combustion for boilers either with or without fuel economizers or other waste heat absorbing devices.

Furnace Draft May Be Accurately Computed

The furnace draft may be pretty accurately calculated for any well-designed boiler. The draft required to carry the exhaust gases up the chimney, though considerably less

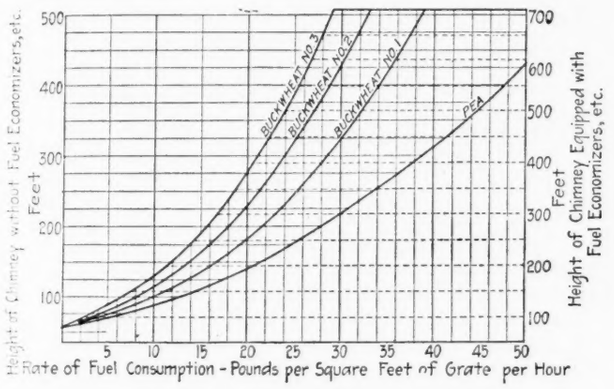


CHART 1. HEIGHT OF CHIMNEY REQUIRED FOR VARIOUS RATES OF COMBUSTION

than that needed to draw them to the base of the stack, is nevertheless quite an appreciable proportion of the total draft.

The draft required to move the gases from the combustion chamber to the base of the stack, other conditions remaining the same, depends upon the temperature of the gases on delivery to the stack. This temperature in turn depends upon the efficiency with which the boiler is operated. It should therefore be taken as that temperature occurring under the best operating conditions, and may consequently be considered as fixed.

The total draft (natural) is dependent, of course, upon the height of the chimney, or the difference in elevation between the fuel bed and the top of the stack. This height consists of the sum of the heights necessary to create (a) the draft requisite for drawing the products of combustion from the combustion chamber to the base of the stack. This is a certain constant height for boilers with fuel economizers, etc., at a given rate of combustion and another fixed height for boilers without such heat reclaiming devices, and in either case is quite independent of the kind of fuel consumed. (b) Another height is necessary for the creation of the draft required to draw the requisite air through the firebed, etc. This depends upon both the rate of combustion and upon the size of coal burned. (c) Still another height is required for creating the draft necessary to elevate the products of combustion from the base to the top of the stack. This height must necessarily be taken as fixed and therefore that required during the hottest day of the year.

Ordinarily these three subheights are not calculated, empirical formulas being employed for arriving at the total height of stack. Probably such practice is justified by the fact that, at best, calculated heights must be liberal in order to meet the most exacting conditions that are liable to arise.

Based on results from a conservative formula for ascertaining chimney heights, checked and modified so as to accord with results attained in actual practice, the necessary heights of chimneys for various maximum rates of consumption of the four sizes of anthracite steam coals are graphically depicted in Chart 1. The data so presented is conservatively accurate for installations in most localities in the United States, but where the summer temperature is apt to go above 100° F., slightly higher chimneys should be employed.

A Chimney Less Than 60 Ft. High Is Useless

Some interesting points are brought out by this graphic presentation of facts, which are too seldom realized. For instance, if steam sizes of anthracite are to be used in a power house and no mechanical draft equipment is installed, a chimney less than 60 ft. in height is practically valueless, even if fuel economizers are not installed. If fuel economizers are employed, the chimney would have to be nearly 85 ft. in height before any fuel could be burned on the grates; the installation of such heat-reclaiming devices adds something like 37½ per cent. to the necessary height of the chimney.

The most striking fact brought out by the chart is, however, the alteration necessary in height of chimney when changing from the use of one grade of fuel to one of lower grade. As an example, if a plant without fuel economizers is to be operated on pea consumed at a maximum rate of 25 lb. per sq.ft. of grate per hour, the chimney necessary to produce the requisite natural draft would be about 175 ft. in height. Should it be advisable to change the plant fuel and burn buckwheat No. 3, the height of chimney necessary to secure the same rate of combustion would have to be approximately 385 ft.

Even with such a chimney, however, the same steaming capacity could not be attained, on account of the lower heating value of the fine coal—a more rapid rate of combustion would be necessary. The average relative heating values of pea and buckwheat No. 3 vary about as 1.5 : 1, so that the rate of combustion, in order to secure the same steaming capacity for the plant operating on the lower grade of fuel, would have to be increased to about 37½ lb. of buckwheat No. 3 per sq.ft. of grate per hour. Besides requiring a larger stack (greater in cross-sectional area) to accommodate the greater volume of exhaust gases, the chimney would have to be of entirely impractical height, unless mechanical draft equipment was installed—the necessary height being probably close to 1000 ft.

Though changing the plant fuel from pea to buckwheat No. 3, when the necessary maximum rate of combustion of the larger coal is 25 lb. per sq.ft. of grate per hour, would be quite out of the question, unless mechanical draft

was resorted to, it might be possible to use buckwheat No. 1 to advantage. To secure the necessary draft for maintaining the rate of combustion with the lower-grade fuel, the chimney would have to be increased in height to about 245 ft. To secure the same steaming capacity, the rate of maximum consumption would have to be increased to 25½ lb. per sq.ft. of grate per hour, the relative heating values of pea and buckwheat No. 1 being about as 1.02 : 1, which would necessitate a chimney about 255 ft. high.

Disregarding the fact that in order to secure similar chimney efficiency the cross-sectional area of the stack should be somewhat increased, changing the plant fuel to buckwheat No. 1 would necessitate a chimney nearly 50 per cent. taller than the efficient height of chimney when burning pea. The cost of building a chimney 50 per cent. higher than another is more than 50 per cent. greater, both on account of the greater difficulties of construction and the fact that the foundation required for the taller chimney would be considerably more expensive than that necessary for the shorter stack. The difference in initial cost would be about 70 per cent. Remodeling a chimney would entail even greater expenditure, so that a conservative estimate of the cost of remodeling a chimney so as to increase its height 50 per cent. would be about equal to the cost of the original chimney.

A Larger Stack Is Necessary for the Smaller Sizes

The foregoing does not take into account the increase in cross-sectional area of stack required to accommodate the greater volume of exhaust gases. The cross-sectional area of the stack is of even greater importance to efficient boiler operation than is the stack height.

A stack that is too low for natural draft operation can still be used if its draft is supplemented by that from some mechanical-draft equipment. A chimney of some kind is always required to carry the products of combustion to a sufficient height to allow their proper diffusion with the atmosphere.

The size of chimney, likewise, must meet certain requirements. It must always be ample to receive the output of the breeching without creating undue resistance by throttling or the formation of dead spaces in the boiler due to the difficulty of the gases passing into the breeching. This accommodation must be capable of caring for all the exhaust gases at the maximum rate of combustion. This is true regardless of whether natural or mechanical draft is employed and is about the only condition that permits of no variation.

Of course the grade of fuel consumed affects the question, for the size of chimney is not dependent upon the heating value, but upon the total weight of fuel consumed in a given time and the quantity of air that must be admitted for its proper combustion. Leakage through the boiler setting, etc., has also to be counted on, and as more air is required for hand firing than when employing automatic stokers, it is usually advisable to proportion the stack capacity to care for the maximum possible demands.

The shape of the stack's cross-section and the nature of its internal surface modify the carrying capacity of a chimney, but as stacks are almost invariably either round or square, of steel or masonry construction, definite sizes for any rate of combustion can readily be calculated for "standard" chimneys. A circular steel stack permits the smallest cross-sectional area; a circular masonry chimney or a masonry-lined chimney requires a cross-sectional area about 5 per cent. larger, as does also a square unlined steel chimney; while a square masonry chimney or a square steel chimney lined with brick requires still an additional 5 per cent. in cross-sectional area in order to handle the same amount of exhaust gases.

The relationship between the size of chimney, of various shapes and constructions, and the maximum total coal consumption, based on hand-firing operation, either in pounds or tons per hour, is graphically depicted in Chart 2. With the assistance of this chart, almost any standard type of chimney can easily be properly proportioned, so far as its size is concerned. It provides also a valuable and accurate means of ascertaining whether an existing chimney would permit a change in the grade of fuel employed at the station.

Little Difference in Size of Stack When Using Pea or Buckwheat No. 1

Considering a plant burning pea, the maximum rate of consumption being as before 25 lb. per sq.ft. of grate per hour, with a total grate area of 260 sq.ft., the maximum coal consumption per hour would be 5750 lb., or 2⅞ tons. This, if the chimney had a circular masonry or masonry-lined stack, would require a chimney (stack) diameter of 6 ft. 9 in. Employing buckwheat No. 1 to secure the same steaming capacity would necessitate an increase of about 1½ in. in stack diameter. A chimney 6 ft. 10½ in. in diameter would cost about 2 per cent. more to build than one 6 ft. 9 in. in diameter, the cost for a given height of chimney being about proportional to the quantity of coal consumed at the maximum rate of combustion.

Though such comparatively slight advisable increase in diameter of stack might be overlooked, without much danger of ever overloading the chimney, if the change was from pea to buckwheat No. 1, an increase in diameter would be highly necessary if it were decided to install mechanical draft and use buckwheat No. 3. In such an event, the fuel that would have to be consumed in order to realize the same steaming capacity would be about 50 per cent. more by weight than when burning pea, so that the maximum coal consumption would be 8625 lb. per hr. instead of 5750 lb. This would necessitate a stack nearly 8 ft. in diameter, and the cost of a brick chimney so proportioned would be, for a given height, about 20 per cent. more than that of an equivalent and similar chimney for the use of pea.

The examples cited show directly, not only the heavy expenditures required to make alterations in existing chimneys, but also indirectly the great wastes that are represented by the use of chimneys of greater capacity than that actually required. The converse deductions are every bit as important as those that are brought out directly.

Though the charts presented and the general discussion have aimed to point out facts by which more efficient chimneys can be designed than those so frequently encountered, they serve equally well as guides by which existing chimneys can be modified so as to secure greater economy in the cost of steam generation. For instance, Chart 1 indicates at a glance when it would pay to install fuel economizers in a plant operating on natural draft. If the existing chimney is 37½ per cent. higher than necessary to produce the requisite draft for the most rapid rate of combustion—a state of affairs that is not at all uncommon—economizers could be profitably installed.

As any type of draft equipment is but a substitute for an additional height of chimney, this chart likewise provides a reliable measure of the draft-equipment capacity required for the fuel economizer, so that the exact monetary value of such heat-reclaiming apparatus can readily be calculated for any type of power plant.

Chart 2 is really the more valuable, however, both when designing new chimneys and for investigations of the possibilities of increased plant efficiency from higher rates of combustion, changes in fuel, etc. It is more important to have room for the accommodation of the products of

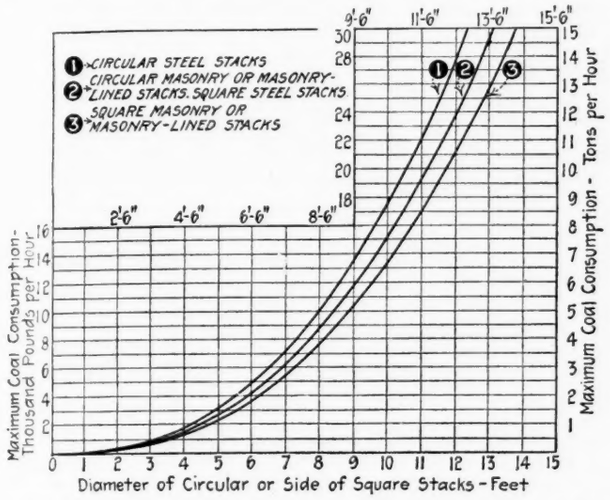


CHART 2. RELATION BETWEEN SHAPE, CONSTRUCTION AND MAXIMUM CONSUMPTION

combustion than it is to have a chimney of sufficient height to draw them from the combustion chamber, etc., and discharge them to the atmosphere without assistance of mechanical-draft equipment.

It is well, therefore, to lay out a new chimney so as to be able to accommodate all the exhaust gases when using the lowest grade coal that the plant is ever liable to employ and at the maximum rate of combustion for that particular coal, not the maximum rate of combustion for the grade of coal for which the plant was planned. With the continually increasing price of coal, particularly anthracite, it is always possible that a plant may eventually realize economies by adopting a lower grade coal for its fuel than that most economical at the time the plant was erected. When such an occasion arises, the ability of the chimney to accommodate the gases from the lower grade fuel often governs the wisdom of the change.

It is more desirable to make the chimney big enough than it is to build it high enough. Most mistakes in chimney construction are made in building too high. The money wasted in such a way could be put to much better use in making the chimneys larger, for then a poorer grade coal could be used, should the necessity or opportunity therefor arise.

Electrical vs. Steam Winding

A few years ago the suggested employment of electric motors in place of steam winding engines would have been scoffed at. Today, as John Gregory recalled in his presidential address before the North Staffordshire Institute of Mining Engineers some months ago, in spite of an enormous increase of depth and load, there are few instances where, in laying out a new colliery, a considerable advantage cannot be obtained by their use.

The length of time occupied in a single wind is so short that the utmost attention must be devoted to the periods of acceleration and retardation, and it is here that the electric motor is particularly advantageous, while its even turning moment contributes to the steady running of the winding rope.

Generally speaking, however, it is only in new collieries that electrification is possible, and as yet the steam winding engine continues to be the principal means of raising coal to the surface in Britain. Mr. Gregory admits that the steam engine is well suited for such work, but the steam consumption is inevitably high, and in spite of the application of various forms of automatic cutoff, it was not until the development of the exhaust steam turbine that a serious waste could be checked.

Since their first application some 8 or 10 years ago, the use of exhaust steam, and more lately mixed pressure turbines, has rapidly extended, and today there are few collieries of any size in England where a plant of this description is not installed, either for the generation of electricity or the compressing of air for supplying auxiliary power.

Wellington Coals in the San Francisco Market

The coal coming from British Columbia is mostly the Nanaimo product mined by the Western Fuel Co. Some Comox coal is also brought down for bunkering purposes. There is little Ladysmith or Boat Harbor coal coming into this market.

The coal mined by the Western Fuel Co. is sold here as New Wellington or short Wellington coal. It took the name and reputation of the Wellington coal mined and introduced into San Francisco by Alek Dunsmuir, who had bunkers and yard at that city. In 1905 the agency for Comox and Ladysmith coal was taken over by the Western Fuel Co., as well as the bunkers and yard referred to, situated at Folsom St. The old Wellington coal originally brought into this market was well liked, and it established the reputation of Vancouver Island coal in general. It had only a feeble competition to contend with at that time, and coal users were not so particular in regard to fuel as they are now. The Wellington has lost much of its old-time glamor. It has been off the market for a considerable time owing to the strike on Vancouver Island. And also Wellington coal coming from Nanaimo is not up to the old standard of the original Wellington as it clinkers.

The Wellington coal is sold in the bunkering trade, for which purposes the Western Fuel Co. is also using some of the screenings. There are also a few thousand tons of Comox in stock at Oakland, which is used for bunkering vessels.

The wholesale price for Wellington coal, as sold to retail dealers, is $7.50 per short ton at this writing. Before the strike the regular price of Wellington coal used to be $8. In Oakland a still better price has been made to dealers in the storage season for coals contracted in quantities of more than 25 tons, for which a price of $7 has been asked. Screenings are wholesale to retailers at $5 a ton, but are difficult to sell and do not bring more than $3.50 to $4.50 in scow-load and carload lots.

Coal Mine Accounting System

By J. C. McNeil*

SYNOPSIS—The financial failure of many coal-mining companies can be traced to a faulty system of accounting. A mine like a bank should so keep its accounts that there will be no loss of capital.

The purpose of any accounting system is not to merely record the debits, or charges, and the credits, or payments and allowances made. Any accounting system which does not thoroughly analyze the transactions and give a complete history of the business is worse than useless.

With manufacturing, mercantile or any kindred business a portion of every dollar taken in revenue goes to increase the assets and to make the business more valuable. It is not so with mining. Every ton of coal taken from a mine decreases the value of the property to that extent. It is highly essential, therefore, that the cost of doing business be known accurately.

I know of a number of men who opened coal mines in the days when anything that was black sold for coal. They enjoyed a reasonable market for the output at a fair selling price. The miners were paid good living wages and there was little dead expense. At the end of every year the books were balanced, and when the bank balance showed up nicely and all the current bills were paid, the remainder was divided among the stockholders.

The years passed, and before they were scarcely aware of it, the mine had been worked out. Some of the stockholders suggested moving to other fields; but then that meant the organization of a new company, and refinancing. All of the stockholders in the old company were not able to go into the new one and enter the other field. The company itself could not make the change, as it had no assets. In the 20-odd years the company had been in business good dividends were paid the stockholders and they consoled themselves with this fact.

Suppose, for example, that they had put their money into bank stock, and at the end of 20 years the bank directors had come to them and said: "Let us have some more money. We have been in business for 20 years and have used up the capital." That would forthwith have called for an investigation; but they would never have gone that long in the banking business using up the capital. A proper accounting system would have prevented it.

In talking with another operator about his cost of doing business, I asked him for details as to his cost of production. The figures were given and they seemed fair enough. However, the item of royalty was missing. "How about royalty?" was put to the operator. Oh, he didn't charge any royalty; he owned the land himself! There is another case of not providing for the future.

It is as essential in getting into coal mining to provide an adequate accounting system as it is to get sufficient capital to enter the business. Some concerns sell their coal at about what it costs them to produce it, and sometimes below the cost of production (because an inadequate accounting system doesn't give the facts), and they depend on their merchandise profits and tenement rentals to pay their dividends. This is a mighty big investment for a mercantile business.

The revenues of a coal-mining company are derived from the sale of coal, from the sale of merchandise to employees, the rental of tenements to employees and from other sources. The principal expenses of a coal mining company are for production of output, maintenance of plants, maintenance of mines, distribution of output (sales) and general (miscellaneous) expenses.

In order that the revenues of the coal mining company may be accurately accounted for, an invoice should be prepared for every sale of coal made, whether the shipment is of one ton or several thousand tons, and the invoices must of course be properly recorded in a sales, or shipping, register. In order that a ledger account may be carried with every party to whom the coal is sold, a sales ledger should be maintained and a controlling account carried in the general ledger with this sales ledger. Thus all of the coal sales will be carried in the general ledger under one account.

From time to time sales of materials that are not purchased to be resold are made merely as accommodations to the purchasers. These are not revenue sales, but are primarily credits to expenses, and in order that proper sales may not be distorted, these invoices should not be carried in the sales account, but in a collection bills account. If the number of sales and bills are sufficient to so warrant, a separate ledger would be necessary.

All expenses should be handled on properly supported vouchers. In fact, all payments should be made by check or voucher, and the only cash that would be disbursed by the treasurer would be in the shape of payments to the bank for deposit on account. True, the payrolls cannot be satisfactorily paid by all companies in the form of a check and will have to be made in cash, but a voucher for the full amount should be drawn.

Other expenditures are made by mines in the way of improvements, additions to existing properties, putting in power plants, etc. These should not go into the expenses. They are sometimes paid for out of the surplus earnings, sometimes by the sale of additional capital, either in the shape of stocks or bonds. For these "capital" accounts, a general ledger account should be set up known as "additions and betterments."

It is a known fact that power plants will not last forever and that every ton of coal removed from the property decreases its value to that extent. These contingencies should be met by reserve funds which may set up as liability accounts and the offsetting charges made to the expense accounts. Some concerns reduce the investment accounts—lands, plants, etc.—by the amount of the charges to their expense accounts and reduce their assets in this manner.

By this method it is their intention to bring the property accounts down to zero by the end of the estimated period when the mine will be worked out. However, the writer's opinion is that the reserve accounts should be set up and the money actually taken out of the business and invested in securities of some kind. This, we be-

*Artemus, Ky.

lieve, would be dealing more honestly with ourselves and would enable us to arrive more definitely at the real cost of production.

Railroads in their accounts work them out in such a manner as to find what it costs them to move a ton of freight one mile and what revenue they derive therefrom. So should it be with coal companies. The accounts should be kept accurately and the statistics worked out monthly so that it can be readily ascertained what each operation has cost per ton of coal mined. When these statistics are worked out, the operator can tell at a glance whether his price should be $1 or $1.25. If his average selling price is $1 and his costs according to the statistics are $1.07, after taking out his royalty, depreciation of plant, interest on investment, etc., it wouldn't take a seer to tell him to get into another line of business.

When an accounting system of this kind is adopted and the expenses are in plain figures, low prices and selling coal below cost of production to "keep the organization together" will fall by the wayside.

Automatic Sampling of Coal

A great deal has been written and many discussions have taken place regarding the proper methods to employ to correctly sample coal, says L. C. Bosler in *Power* for Nov. 3, 1914. It seems strange to the writer that some of the larger consumers of coal should continue to use the ancient and crude system of sampling coal by taking a handful or shovelful from each car or bucket unloaded, as the case may be. For a proper analysis of a quantity of coal the first and important thing to get is a representative sample, after which this can be reduced to a working quantity by an automatic machine.

The Philadelphia Rapid Transit Co. has perfected and put in its Beach power station an automatic coal-sampling device by which all of the coal received is sampled without the human element entering into the operation at all.

Coal is received in boats and is unloaded therefrom by two electrically driven locomotive cranes on the pier. The coal is dumped into cars where it is weighed and is then delivered to a conveyor and carried to the crusher. The coal at this point is reduced to a size not greater than 3 in. in diameter. It is then raised to a height equal to the elevation of the top of the coal bunkers and is then conveyed to them. The sampling device is in this last named conveyor.

Referring to Fig. 2, the hopper for catching the major sample is underneath. Beneath this is a No. 00 rotary crusher and automatic sampler, made by the Sturtevant Mill Co., which receives the coal from the hopper. This machine performs two separate and distinct functions; it first grinds the major sample to any desired size and then

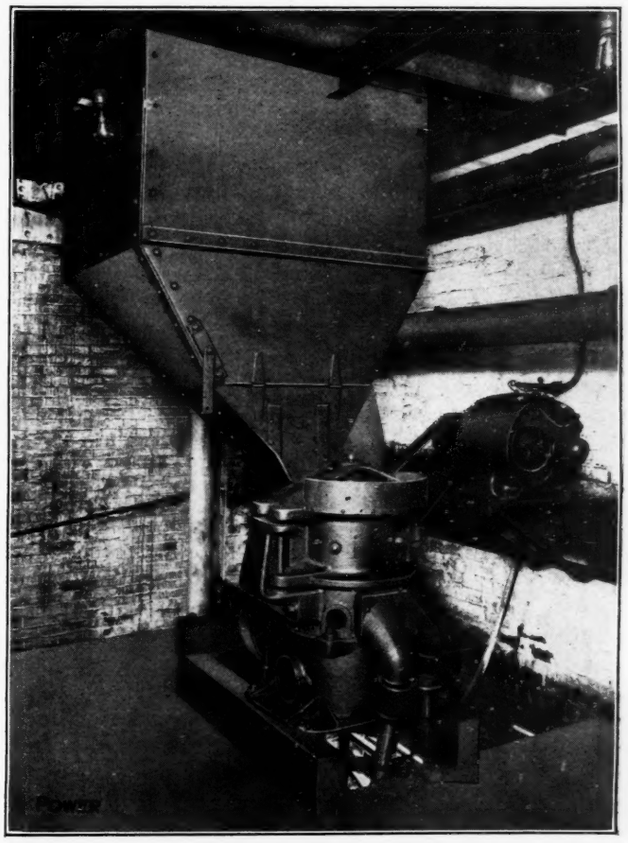


FIG. 1. AUTOMATIC COAL SAMPLER UNDER COAL CONVEYOR

divides it into two parts, one of which is the final sample, it being drawn from the front spout, while the balance falls back into the bunker through the side spout. By operating the adjusting wheel on the grinder, any proportion desired can be obtained between the final and the major sample.

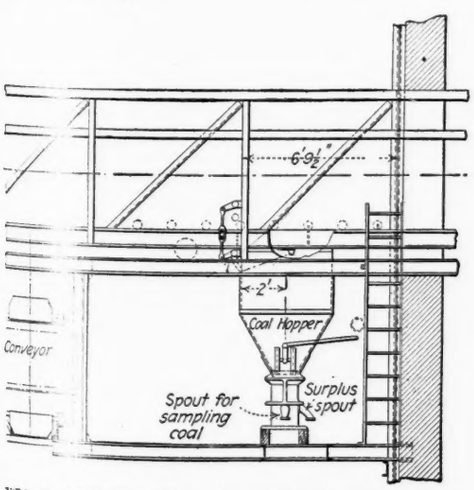


FIG. 2. CONVEYING AND SAMPLING MACHINE

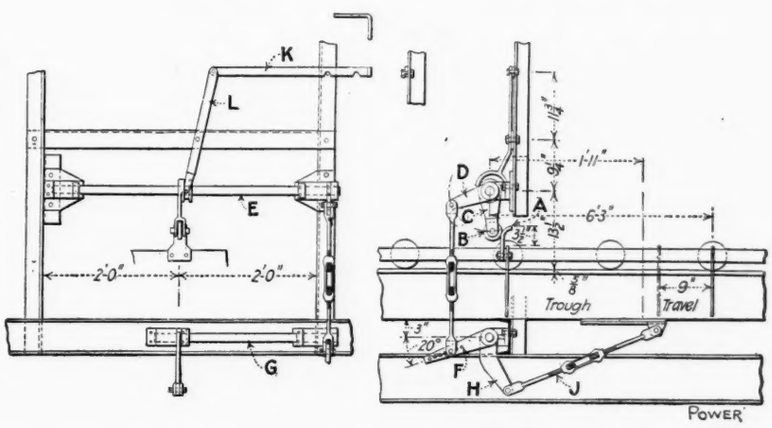


FIG. 3. GATE-OPERATING MECHANISM

Fig. 3 is a view of the gate-operating mechanism. On a flight of the conveyor is fastened a plate *A*. With the movement of the conveyor to the left this plate engages with the roller *B* and thereby raises the arm *C*. With this movement the arm *D* is also raised as both are keyed to the shaft *E*. As the arm *D* raises it pulls up the arm *F*, which, through the shaft *G*, is keyed to the arm *H*. At the end of this arm is fastened the rod *J*, which operates the gate. This gate is closed by the use of a counter-weight attached to the arm *F*. By the pull rod *K*, and yoke lever *L*, the arm *C* can be slid on the shaft *E* out of the path of the plate *A*, thereby cutting the apparatus out of service.

It will be seen that there must be a fixed relation between the position of the flight and the opening of the gate. With the gate wide open when the flight reaches the near side of the hole, the maximum discharge will take place as the coal is always banked against the flight.

The amount of coal desired in the major sample is governed by the number of openings of the gate per revolution of the conveyor and this in turn by the number of arms *A* that are fastened to the flights.

As an example, from each boat load, averaging 800 tons, a major sample of about 1500 lb. is taken. After passing the grinder and sampling machine the final sample is 6 lb.

In Fig. 1 the actual apparatus is shown under the coal conveyor in the boiler room. The two spouts referred to in the foregoing are seen near the bottom of the grinder.

During the recent special tests made by the company on six samples of 1000 tons each, three major samples of 1500 lb. were desired from each cargo. To accomplish this, it was necessary to have four gate openings per revolution of the conveyor, this delivering the required amount. The opening in the bottom of the conveyor trough through which the coal passes to the hopper is 4x6 in. and by actual experiment was found to deliver 3 lb. of coal per opening under ordinary conditions of moisture.

All of the apparatus except the crusher was designed and erected by the company's engineers and has been in continuous service for a year giving excellent results.

Supt. Jones on the New York Coal Specifications

The first test of the new tentative specifications for the purchase of coal for city departments, printed in *Coal Age* of July 24, took place when Patrick Jones, superintendent of supplies of the New York City Board of Education, opened nine bids for furnishing and delivering 23,700 gross tons of No. 3 buckwheat and mine-run coals. Previous to the opening of the bids Mr. Jones had received letters from two coal dealers protesting against the provisions of the specifications, in one instance the writer saying he would not submit a bid.

Mr. Jones refused to make public the names of the dealers, saying he had not yet made his report to the Board of Education, but he did make public his replies to the dealers in which is set forth his opinion of the specifications. In one letter Mr. Jones says:

"I wish to state that before the specifications were approved, the Bureau of Supplies was perfectly satisfied that said specifications would be in keeping with the market conditions. Our experience regarding the ash and B.t.u. for No. 3 buckwheat coal has been that it is always available. Besides, we cannot afford to get coal of an inferior grade, lest the idea which we have in mind be nullified.

"The specifications which we used last year for No. 3 buckwheat coal were practically the same as the present ones. You may recall my visit to your office last year in regard to the regular coal contract. At that time you raised the question of the unfairness of penalties when the contractor frequently delivers coal the quality of which is in excess of our specified requirements. The remission clause in the new specifications has been designed to overcome this difficulty and make the specifications more equitable to the contractor."

The second letter states:

"I was under the impression that the specifications for the present year were more favorable than those we have used in the past. We used practically the same specifications for the year 1914 and had no difficulty in getting bids, and we got the coal as well.

"However, since that time my representative has been coöperating with the Bureau of Standards with a view to making the specifications more equitable. The remission clause, in my judgment, is a very good thing, and many of the large coal dealers have so expressed themselves."

Canada's Coal Production

Sales, shipments, colliery and other mine-consumption and coking production of coal in Canada for 1914, says *Commerce Reports*, amounted to 13,594,984 short tons, valued at $33,433,108, compared with 15,012,178 tons, valued at $37,334,940 in 1913, a decrease of 1,417,194 tons, or 9.4 per cent., in quantity and of $3,901,832, or 10.4 per cent., in value.

Arbitrary values are assigned to coals of Nova Scotia and of British Columbia. These are rated as $2.50 per long ton for Nova Scotia and $3.50 per long ton for British Columbia. In the other provinces prices are those returned by the operators. Distribution of production is as follows:

Locations of Mines	Tons	Decrease	Value
Nova Scotia	7,338,790	641,283	$16,381,228
Alberta	3,667,816	346,939	9,367,602
British Columbia	2,238,339	476,081	6,094,810
Saskatchewan	232,541	19,644*	375,438
New Brunswick	104,055	33,744*	260,270
Yukon	13,443	6,279	53,760

*Increase.

Exports of coal in 1914 amounted to 1,423,126 tons, of a value of $3,880,175, compared with 1,562,020 tons, of a value of $3,961,351 in 1913, a falling off of 138,894 tons, or 8.89 per cent.

Imports during the year included bituminous, lump and run-of-mine, 7,776,415 tons, valued at $14,954,321, an average of $1.92 a ton; bituminous slack, 2,569,632 tons, valued at $3,605,253, an average of $1.43 per ton, and anthracites, 4,435,010 tons, valued at $21,241,924, an average of $4.79 per ton. This gives a total of 14,721,057 tons, valued at $39,801,498. Figures for these classes in 1913 were: Bituminous, etc., 10,743,473 tons, $21,756,658; bituminous slack, 2,816,423 tons, $4,155,622; anthracite, 4,642,057 tons, $22,034,839; total, 18,201,953 tons, $47,949,119. Of the 1914 consumption 45.4 per cent. was from Canadian mines.

The Labor Situation

SYNOPSIS—There are expectations that the Hocking Valley operators will secure a new and lower wage scale. Tom Lewis becomes a secretary for coal operators in West Virginia. Colorado mine workers accuse the governor, attorney-general, national guard and three company presidents of murder. In return those charged suspect that the union officials are guilty of subornation of perjury.

The executive committee of the Ohio branch of the Mine Workers of America held an important session at Columbus last week to discuss plans for securing work for miners in the Hocking Valley district. The demand of the Sunday Creek Co. that equal concessions in the dead-work scale should be given the operators in the Hocking Valley as were conceded in eastern Ohio was not discussed and the officials of the Ohio organization emphatically denied that any change would be made in the working conditions. It is claimed by John H. Winder, general manager of the Sunday Creek Co., that the concessions granted operators in eastern Ohio really mean a reduction of 5 to 15c. per ton on the cost of producing coal.

It was reported in mining circles last week that the miners were thinking of calling on their officials to grant concessions which would permit of the Hocking Valley mines being placed in operation. The business men and shopkeepers of mining towns are said to have been urging this move.

Destitution in Mining Regions of Ohio

In the meantime relief work progresses among the destitute miners and their families in the Hocking Valley. This relief is distributed through the office of the adjutant-general of Ohio. J. W. Wheatley and George A. Shust, miners of the Hocking Valley district, are touring the state and soliciting subscriptions for the relief of destitute families in the coal fields. They have secured substantial contributions of money, clothing and food in the cities visited. Both men have worked in the Hocking Valley district for more than 25 years, tilling small farms when the mines were idle.

The "Five-A Studios," a local moving-picture concern, has just finished the production of a drama called "Silent Valley," based on the troubles in the Hocking Valley field, and partly staged in the mining district with the aid of the miners and their families. The production has the approval of state authorities, and will be shown throughout Ohio to secure funds for the benefit of those in distress in the district.

Freight Rates and Wages in Hocking Valley

The books and records of the Hocking Valley Ry. are being examined by experts under the direction of the Ohio Utilities Commission. The railway company has as yet made no move to secure an injunction to prevent the examination of the books, and it is likely that none will be filed at this late date. The experts say that the data will be in shape for presentation to the commission when the hearing on the rate question is resumed, Oct. 5.

On a recent visit of John H. Wilder to Assistant Adjutant-General E. S. Bryant the former stated that not until there has been an adjustment of mining conditions will the Sunday Creek Co. be able to open its mines. The governor's office has been petitioned to act to assure the reopening of the mines in the Hocking district. The claim was made that the recent 15-per cent. reduction in freight rates by the Hocking Valley Ry. would enable the mines to reopen. It appears, however, that only 5 per cent. of the tonnage of the Sunday Creek Co. is shipped over the Hocking Valley Ry., while the remainder is transported by the Toledo & Ohio Central, which has yet made no move toward reducing its freight rates.

Tom Lewis Becomes Secretary for Operators

Through the influence of Quinn Morton, president of the Imperial Coal Sales Co., and Edward Schoenebaum, of the Marmet-Halm Coal Co., members of the executive committee of the recently organized High Volatile Coal Operators' Association of West Virginia, Thomas L. Lewis, of Bridgeport, Ohio, has been made executive secretary of the association.

This selection caused much surprise, for Lewis was at one time president of the United Mine Workers of America. However, there is general confidence in his ability and honesty, and the operators are well satisfied with his selection. The name of the association has been changed to the Splint and Gas Coal Operators' Association of West Virginia.

It appears that for several months the officers of the labor organization have maintained in Colorado a staff of nearly 40 private detectives who have endeavored to obtain evidence against the mine operators. As a result of their work it is said that charges of murder will be made against the governor and attorney-general of the state, the officers of the state national guard and Presidents Jesse E. Welborn, of the Colorado Fuel & Iron Co.; David W. Brown, of the Rocky Mountain Fuel Co., and John C. Osgood, of the Victor-American Fuel Co.

Union Detective Asked to Perjure Himself

On Aug. 28 the governor appointed a military court of inquiry, which was conducted by Colonel Boughton according to regular army rules. It secured sworn testimony from various persons involved in the accusations of the union leaders. It appeared that former Adjutant-General C. D. Elliott, of West Virginia, a union detective, had been instructed that it would not be necessary for him to substantiate charges he might bring against the operators or state officials, as he was expected to use such accusations only in attempts to induce the dropping of prosecutions now pending against mine workers and union leaders.

Written evidence in the form of letters that passed between these detectives and their employers was introduced to show that these agitators were responsible for the demoralization of the state militia. The coal-company presidents accused state that they are prepared to refute all charges and to prove that their persecutors are conducting this attack purely in retaliation for the conviction of John R. Lawson and the indictment of numerous other labor leaders in Colorado.

Michigan Increases Production

Michigan is not a big coal-producing state, yet the U. S. Geological Survey reports that unlike most coal producers it increased its output in 1914 over that of the previous year, the production being 1,283,030 short tons, valued at $2,559,786, an increase over 1913 of 51,344 tons in quantity and $104,559 in value.

Michigan's coal production has exceeded 2,000,000 tons in one year only, 1907; since then it decreased steadily until 1912, when it reached the minimum for the decade. The decrease is attributed to the competition of higher-grade coals from West Virginia and to the small demand for lump coal in the manufacturing plants of the state.

The mines were free from labor troubles, and no time was lost because of strikes. The coal-mining fatalities, as reported by the Bureau of Mines, consisted of one death from fall of roof and one from an accident in connection with mining machinery, a total of two, as compared with three in 1913 and eight in 1912.

Lamp Declared Permissible

On Aug. 21, 1915, the Bureau of Mines approved as permissible for use in gaseous mines the steel, flame safety lamp known as Koehler Model No. 1, manufactured by the Koehler Manufacturing Co., Marlboro, Mass. Approval No. 201 has been issued to the Mine Safety Appliances Co., 541 Fourth Ave., Pittsburgh, Penn., general agent for the lamp.

At present this approval extends to this type of lamp only when equipped with a flat wick and permanent horseshoe-magnet lock. The only globes so far approved for use with these lamps are those identified by the symbol "Macbeth High-Speed No. 210," manufactured by the Macbeth-Evans Glass Co., Pittsburgh, Penn. The only igniter so far approved for use with these lamps is the Koehler Model 1915 Pyro Igniter, manufactured by the Koehler Manufacturing Co., Marlboro, Mass. This lamp is the first to be approved by the Bureau of Mines according to the provisions of Schedule 7.

Editorials

Has Union Activity Helped Labor as a Whole?

A separate report was made to the Commission on Industrial Relations by the three labor leaders in that body, defending the purpose of unions and lauding their work. They evidently recognized that there were still many people who questioned the value of labor organizations to working men, and it must be admitted that there are reasons for the uncertainty which still prevails as to the value of solidarity as a means of raising the welfare of workingmen as a whole.

We are told that unionism has raised wages, but it is a fact that in the memory of men still living ablebodied men worked for 50c. a day at employment which was then, and is still, ununionized. The same work now pays $1.50 to $2 per day. Many men in 1890 worked for 10 hours and received only a dollar. Their services could not be secured for that today; yet these same men are still without a union. It is hard to show that any combination was the cause of the 200 or 300 per cent. increase in wage which has taken place since the middle of the last century.

Of course, it will be said that these men partook in the general rise secured by unionism. It is as useless perhaps to deny it as to attempt to prove it. The influence of example in the rise of nominal wages is so intangible that it is hard to evaluate.

But such gains as have just been discussed are really largely nominal, not actual, for the only real gain of the workers, outside of that arising from efficiency, is obtained by reducing the profit of the employers. If every dollar every employer received were handed on to his workers the wage would be the highest possible. Any higher wage would be merely reflected in higher cost of living and would be merely a nominal, not an actual, increase.

Consequently the proportion of the selling price which the worker receives is the norm on which his wage should be determined. It is absurd to figure it in money values except for purposes of comparison between workers. It is its fluctuation with the selling price of products which is important.

In general it is doubtful whether in recent years this ratio has increased much in many trades. Even the unions do not assert that it has. In some industries, it is true, it has reached a maximum. In the coal trade it has almost always been high except in newly opened coal fields or for brief periods of time. And in this case the union actually admits that the ratio is too high in some states—that is, the price of coal is so low that the operators cannot continue in business and pay their men the wages which the union believes they should be paid and which are provided in covenants with the union.

But as the receipts of the employer in excess of what he pays the worker should be almost wholly and are mainly expended as the capital by which business is made efficient, and without which the business of the company would come to an end, it is questionable whether the union helps the working man when it reduces the employer's profits, for it reduces his opportunity to be efficient. Some mines have suffered so much from enforced economies that they are now no longer economically run, and the miner may get all or nearly all the gross income and yet would be better paid if with better equipment he received a somewhat smaller percentage of the gross value of the output.

It is by no means certainly proven that the greater prosperity working men now enjoy is due to union activity. It is more probable that it arises from increased intelligence of employer and employee and from improved machinery. The union has concentrated its efforts on distribution. Someday we may realize that there cannot be a 100-per cent. division for the worker. We may learn that some part of the product must be kept back either as savings by the workman or as profits by the employer, whether that employer be an individual or the state.

But be that as it may, steadiness of work is an essential of prosperity, and it is not certain that the union has made the conduct of industry more regular. In fact, there are many who think that the union by its strikes, by its creation of inequalities of wage, whereby the industry in whole states is made impossible, and by the unrest it has occasioned, has caused much of the present idleness and dislocation of business from which the country suffers. Possibly this is partly true, though restrictive legislation alternated with unequally and unduly helpful enactments, such as tariffs, both fitfully applied, are at least as much to blame as union activity.

The unrest is not wholly in labor. Business is also in a turmoil and the unrest of one has completed the unsettlement of the other, for men in idle industries become impoverished and consequently discontented, and conversely companies with men on strike cannot pay the bills they have incurred or interest on their bonds and they become bankrupt. Thus the turmoil of business causes industrial unrest and the active protests of the men ruin what business is being conducted.

Some unions have succeeded in securing wages for their members above the average, in other trades or in the same trade in other fields, and this is the stock argument of the advocate of unionism. He points out that only the continuance of the union assures the payment of such larger wages despite the protests of the jobbers and the manufacturers. But it must be remembered that these wages are maintained at the cost of the consumer and therefore are burdens on other workers.

By the use of certain muscles a man can raise his arm. Strive as he will he cannot lift his whole body by hauling on his shoulder straps. Unions like muscles can lift a part of labor by agitation, but they cannot raise the whole body of labor by such methods. Raising the wage of the miner, for instance, inevitably increases the cost of living to all who have to buy a bucket of coal.

A well-organized industry with international power, manufacturing any commodity, could fix wages at any high level and make other men pay them if they could restrain strikebreakers. Some industry may yet succeed in raising wages to an unheard-of level, and with the trusts they may succeed in convincing the world that both unions and trusts must be controlled. Such control may seem so socialistic that the whole body of socialism will be accepted as the most satisfactory outcome.

The strike of the miners in Great Britain may have such an effect, even though not international. The British people will pay anything for coal which operators may demand. The operators can then pay any price to the miners. What remains if both or either are unreasonable? Legislative restriction. The miners resent this, though the operators have already consented to it. If the miners persist probably socialism will be inevitable. But there is nothing to show that the miners will be benefited by the change.

On the New York Post Office runs the proud motto, "Neither snow, nor rain, nor heat, nor gloom of night"—no, nor even children slain by motor cars on the streets—"stays these couriers from the swift completion of their appointed rounds."

Let the miners read it and remember that it is no idle boast, for the rules which back it are most stringent. A private concern could not brag so openly of the extremities through which, under bond, it forces its employees to comply with its contract.

Significance of Labor Day

Labor Day is the heaven-sent opportunity for the district attorney and candidates for office to make speeches about the dignity of labor in which they only half believe. They try to edge themselves in as laborers by referring to the fact that there is both body and brain toil. Their platitudinous utterances are little heeded and soon forgotten. The district attorney goes home, does as little muscle work as he can avoid and firmly decides that his children shall not do more.

In fact, he talks somewhat disconsolately and socialistically, bewailing that the trusts have cornered all opportunities and gives his children no chance. He knows that they have an opportunity to work at that muscle labor which he has just been praising, and which in his heart he condemns, but he has decided that for them a certain lucrative brain labor should be provided; and as he is doubtful of their ability he begins to rail that "every door is barred with gold and opens but to golden keys."

There is a great race, every member of which is a brain worker. It has produced and is producing despite handicaps many distinguished men. Yet it has not for ages been a nation. For the most part the people of the race do not want an independent national existence, for they know they lack muscle workers. Where the race has had a chance to get to the soil, it has failed. The muscle workers were lacking, and being for the most part shrewd, the people of the race have recognized the difficulty and respected their limitations. Most of them are opposed now definitely to any attempt at national existence which would to all appearances be futile and might be ridiculous.

The importance of the muscle worker is thus made apparent. Those who regret bitterly that the brain workers—"the better class," as they term it—do not multiply and replenish the earth might take this example to heart. Abraham Lincoln said, "God loves the common people or he would not have made so many of them." And perhaps Lincoln, though he did not allege it, realized how fully this thesis could be applied to the increase in the race.

It is perhaps well that it is the muscle workers who are doing the mosaical replenishment and not those brain workers who feel themselves so desirable. We may well rejoice that the former are so common. It would go ill with us if they were not. Are the sons of rich men such desirable people and will there not always be enough abnormal descendants of muscle workers to furnish us with the instructors and leaders of the race?

The muscle workers are for the most part inarticulate or imprecatory. In either case they do not command an audience, but their importance as the backbone of the nation is unquestioned. If their forensic eloquence was as marked as their muscle they would have had us all as much converted to the importance of their services as we are already convinced as to the value of brain work and human leadership.

Some "Bull" Features in Middle Western Market

Close observers believe that several factors are developing in the Western trade situation which will occasion price advances for free coal before the season progresses much further. One of these is the comparatively large number of mines which have been closed down in Western states during the past dull summer and abandoned permanently. No new operations have been opened to take their place, and the withdrawal of this tonnage from the coal marts must create an additional demand on other producers. The delayed ordering of coal is another factor in the situation; and the late harvesting of grain, which is likely to result in the movement of crops simultaneously with increased shipments of coal, will probably cause a congestion of equipment and car shortage. Finally, there is a lack of men in many mining districts, due to the return of foreign miners to Europe and to a decline in immigration.

Vich Iss der Cheepest?

The coal industry has its quota of buyers—usually those termed purchasing agents—whose sole standard is price.

How wide they often are of the mark of economic buying, and how far astray this standard sometimes leads, is aptly illustrated in this story.

A Hebrew approached the ticket window of the railway station in one of our large cities and said, "I vant a ticket please to Springfielt."

The agent hesitated a moment and then inquired impatiently. "Well, Springfield what? Springfield, Ohio; Springfield, Massachusetts; Springfield, Illinois; Springfield, Missouri—which Springfield do you want to go to?"

The Hebrew, coming closer to the window and holding his greasy purse a little tighter, replied, "Vich iss der cheepest?"

It may be trite to remark, but nevertheless it is true, that "cheapest in price" does not always mean "most satisfactory in service."

Sociological Department

Field Meet of the Utah Fuel Co.

SYNOPSIS—The meet of the Utah Fuel Co. does not bring together many teams, but it is most conscientiously undertaken, so as to be of the utmost value to the participants and to foster the work among the employees generally.

The annual first-aid and mine-rescue contest of the Utah Fuel Co. was held at Castle Gate, Utah, Aug. 21, 1915. As usual, this field day partook of the nature of an annual picnic or reunion, and social features were combined with the contest. Special trains were run from the Pleasant Valley and Sunnyside districts and brought several hundred people to witness or participate in the events. The uniformed bands from Clear Creek and Sunnyside helped the Castle Gate band to enliven the occasion. As each train arrived it was announced by the explosion of bombs, the visitors being met at the station by the reception committee and the Castle Gate band, which escorted them to the public square in the center of the town where the contests were to be held.

The meet this year was of particular interest and importance to everybody, especially the contestants, for in addition to the usual prizes given each year the company undertook to send the team which made the highest combined score in first-aid and mine-rescue work to the Panama-Pacific International Exposition at San Francisco to compete in the Third Annual Joint Field Meet of the Bureau of Mines and the American Mine Safety Association on Sept. 23 and 24.

ELIMINATION CONTESTS HELD AT EACH MINE

In order to aid in the selection of the best team, elimination contests were held at all Utah Fuel Co. camps on July 24, in which one team was selected to represent each mine in the main contest held at Castle Gate Aug. 21. In this way six teams were chosen which were supposed to be the pick of the mines, and they were given about a month of special training in preparation for the main event. An outside expert in mine-rescue work was employed for two months in thoroughly drilling the men in helmet work and thus supplementing the valuable instruction of the United States Bureau of Mines, which, on account of exhaustion of appropriations, had to discontinue the rescue-car training in Utah some time ago.

The team from Somerset, Colo., was entertained by the Castle Gate Welfare Association, while the other teams and visitors were provided with accommodations and refreshments by the company. Rest pavilions were erected at convenient places for the benefit of visiting women and children.

In the afternoon a ball game was played by the Sunnyside and Castle Gate teams at Riverside Park, the scene of last year's first-aid contest, and was won by the Castle Gate team by a score of 8 to 6. After the ball game the Castle Gate band gave a concert in the public square, which was largely attended. An enjoyable dance concluded the festivities.

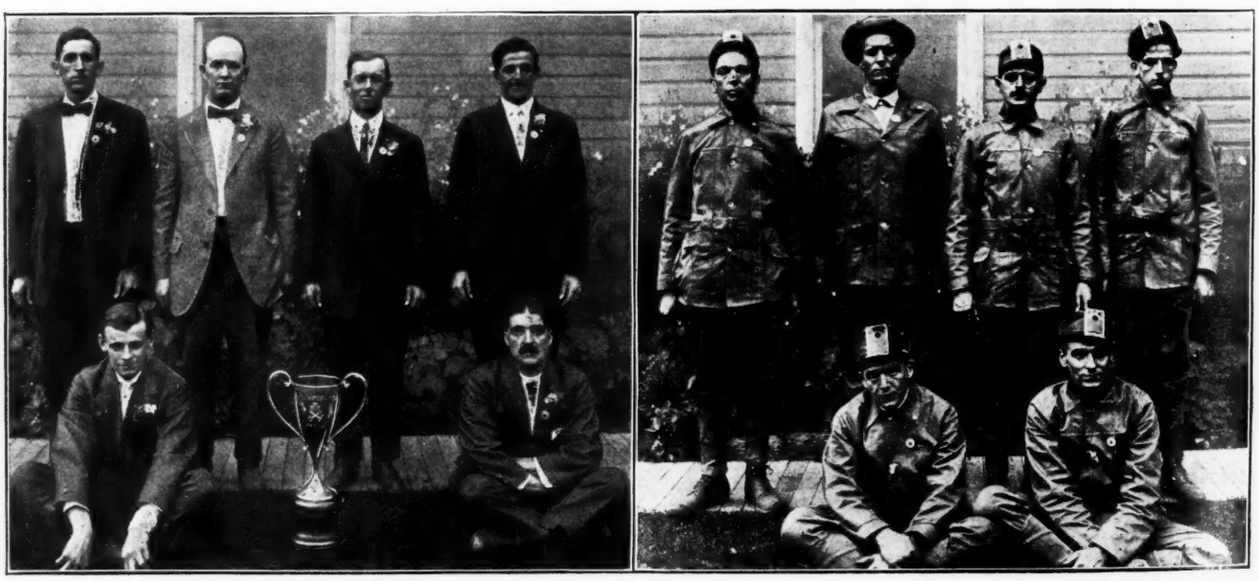
Preparations for the meet were put in the hands of committees selected from the Castle Gate Welfare Association, the success of whose work was well attested by perfect accommodations and the smoothness with which everything was accomplished.

The contests, in both first-aid and mine-rescue work, were conducted strictly under the rules adopted for the joint field meet at San Francisco, and with the exception of the problem in rescue work, all the problems were selected from practice problems suggested by the Bureau of Mines and the American Mine Safety Association.

ELABORATE PROVISIONS FOR RESCUE EVENT

The grounds were laid off close to the Knights of Pythias Hall, in the basement of which was built an imitation of a mine for the mine-rescue contests. A plan of the workings is shown. The problem illustrated proved to be one of great difficulty. The teams had to go down the 30-per cent. incline to the entrance, which was a narrow doorway with a brattice hung over the opening to exclude outside light, then along the supposed entry made of posts, boards and brattice cloth about 4 ft. high. Opposite the room neck a small fire was supposed to have started, which had caused quite a fall of rock in the entry outby. The timbers had broken and were hanging, pointed toward the center of the entry from the posts, making an opening about 4 ft. square, through which the rescuers must pass. Trolley wire and power lines were hanging loose, but not touching. Two men who had to be rescued were supposed to have been working in a room which had no crosscuts off the entry inby the fire. These men had found that owing to the poisonous atmosphere they were prevented from making their escape and so had built a barricade in the room neck about 15 ft. from the entry.

So as to give an equal chance to all, all the four contesting teams were given the same rescue problem. This was



WINNERS OF FIRST AND SECOND PRIZES AT MEET OF UTAH FUEL CO.

On the left the cup holders, Sunnyside No. 2 team, and on the right No. 1 team from Winter Quarters

read to them separately after they had finished the test-of-apparatus drill, and the men were enjoined not to disclose it to the teams following them. Naturally, they did not care to give any undue advantage to their competitors, so they kept the problem secret.

CARE TO AVOID INEQUITABLE JUDGING

The judges for all events were J. C. Roberts, mining engineer, United States Bureau of Mines, Denver, Colo.; J. E. Pettit, state coal-mine inspector for Utah, and H. H. Sanderson, of Salt Lake City, agent for the Draeger Oxygen Apparatus Co. As there were four field events in first aid, the judges could not be assigned to different teams each time, but each judge had to inspect the work of one team for two events. Thus it was that the teams had the same judges in the one-man and full-team contests. In the mine-rescue contest, H. H. Sanderson judged the inspection-of-apparatus work, while the two other judges, Roberts and Pettit, took the work underground. The men's pulses were examined by physicians of neighboring towns.

In the first-aid work six teams competed, one from Somerset in Colorado and the others from Clear Creek, Utah Mine, Winter Quarters, Castle Gate and Sunnyside in Utah, but in the rescue work two of these teams—those from Somerset and Utah Mine—did not compete.

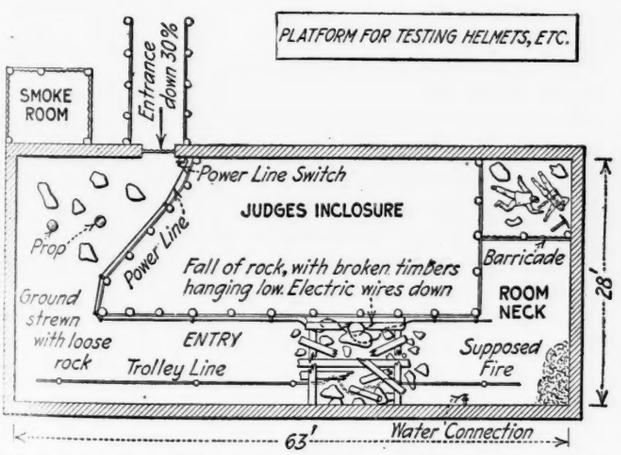
The judges met the evening preceding the meet and decided which problems should be presented. They also discussed the rules by which the events were to be judged. The greatest care was taken to make everything uniform and strictly impartial, and it is believed that absolute satisfaction was given by the decisions. The company feels very grateful to the previously mentioned officials for the services rendered, as their work was hard and unenviable.

PROBLEMS AND THEIR SUCCESSFUL SOLVERS

The problems were as follows:

One Man Event—A man has been overcome by gas in a place so low that he cannot be carried in an upright position. Transport him 20 ft. to a place where the bearer can stand upright and carry him 20 ft. further by the "shoulder carry." Perform artificial respiration by the Schaefer method for one minute. Time, 8 min. Winter Quarters No. 1 and Clear Creek No. 1 tied for first place in this event, both obtaining a perfect score. The second highest score was 96.

Two-Man Event—A man is found lying face up, with his shoulders resting on an electric wire. He is unconscious and



PLAN OF AN ARTIFICIAL MINE IN WHICH ACTUAL DIFFICULTIES IN MINE RESCUE WERE DUPLICATED

his shoulders are burned. Rescue and give him treatment. Time, 8 min. Castle Gate No. 2 and Sunnyside No. 2 both made perfect scores, thus securing first place. Their nearest competitor scored 98.

Three-Man Event—A victim has a puncture wound of the palm of the right hand, with bright red blood, a small cut on the calf of the left leg, with slight bleeding, and his left ankle is sprained. Treat the case. Time, 8 min. The best score was made by Utah No. 1 team, which was in no way demerited. The second highest score was 98.

Full-Team Event—The victim has a compound fracture of the left thigh, a wound 3 in. long on the calf of the right leg and a cut on the outer surface of the right forearm, with profuse bleeding. Treat and carry the patient 25 yd. on an improvised stretcher. Winter Quarters No. 1 made a perfect score. None of the other competitors exceeded 97.

The team making the highest average score in all the events was Sunnyside No. 2. It secured a mark of 97.50. The team comprises the following members: M. H. Detweiler, captain; Zeph Thomas, T. J. Johnson, George Clark, J. W Littlejohn and George Usher.

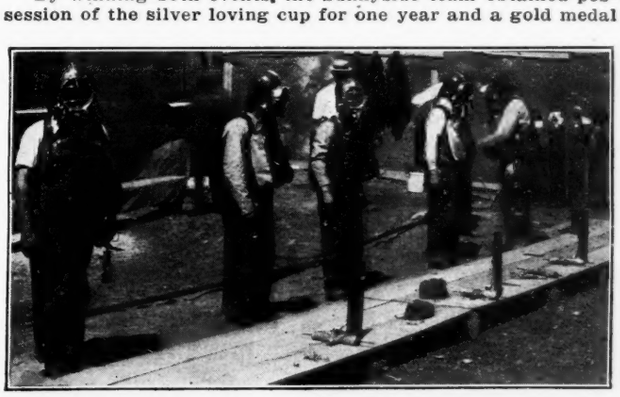
Winter Quarters No. 1 made an average score of 97.25 and secured second place. The team comprises the following members: T. C. Harvey, captain; John Thorpe, James Hall, Horace Simpson, Stanley Harvey and Noah Potter.

Mine-Rescue Event—Smoke is discovered issuing from the mouth of the mine. The crew enters, encounters a bad cave and discovers a fire in the mouth of a room. Men have barricaded themselves against the fire, but have been overcome. Rescue them, working on the fire for one minute. The canary is overcome. Time, 12 min. This event was won by Sunnyside No. 2 Team, with Castle Gate No. 2 a close second.

SUNNYSIDE NO. 2 WINS TRIP TO SAN FRANCISCO

The team making the highest combined score in first-aid and mine-rescue work was Sunnyside No. 2, comprised as above. The average score for all events of the winning team was 91.25.

By winning both events, the Sunnyside team obtained possession of the silver loving cup for one year and a gold medal



A RESCUE CREW BEING INSPECTED BEFORE ENTERING MINE

for each man, all given by the Utah Fuel Co., and in addition will be sent, at the company's expense, to the Panama-Pacific International Exposition in San Francisco, there to compete with teams from all over the country.

The members of the Winter Quarters team, for obtaining the second best score in first-aid work, were presented by the company with silver medals.

The work of all the teams was good and there was little to choose between them, there being only 2.5 points of difference between the lowest and highest scores. The scores for all would have been higher but for the fact that not enough time was allowed for the completion of the problem in rescue work. Obviously, it would not have been right to set a new time limit, so all teams were penalized alike.

The work of the first-aid and welfare societies throughout the camps has been of a high-class order, and much good has been accomplished. These societies have been formed by the miners and others residing in the various towns for the purpose of furthering the cause of welfare and first-aid work, and it is due to the voluntary and enthusiastic support of the men that such success has been attained.

For the winning team—Sunnyside No. 2—now commences a period of hard work in preparation for the California trip. It will have the support of the whole company in its efforts to "bring back the bacon" for Utah.

Model Anthracite Village

A model coal-mining village, which includes houses of steel and hollow-tile construction for the mining superintendent, foremen, assistants and miners, has been planned and laid out for the Locust Mountain Coal and Iron Co. The plant will operate the mining property of the Winton-Dodson Co., of which T. M. Dodson is vice-president and general manager.

The success of this model village will be watched with interest by all mining men of the region, for it is based on ideals of which many men are skeptical. There will be six four-family structures for miners, and each will have a living room, kitchen and bathroom on the first

floor and three bed-rooms, with ample closet room, on the second floor. There will be front and rear porches, hot and cold water, electric lights in each house and furnace heat.

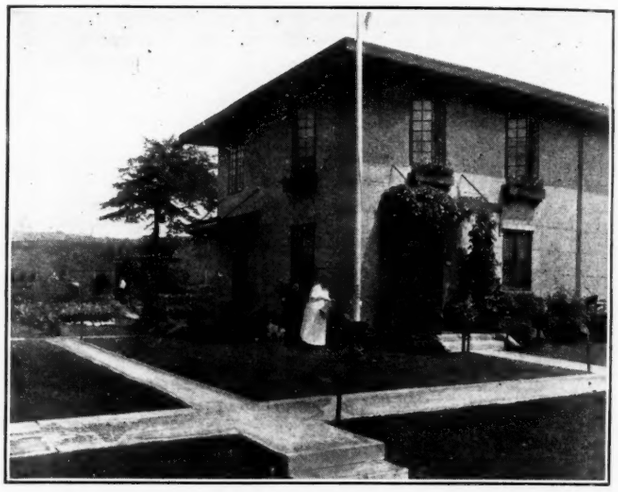
The superintendent's home will be placed between the houses for the mine foremen, and there will be a double house on each side for the foremen's assistants. A general store, garage and workshop will be built of the same steel and hollow-tile construction.

One of the big features of the plan will be a park for the miners' families, tennis courts, a baseball diamond, a swimming pool and an athletic field. There will be terraced lawns, hedges and bushes, which will give a landscape treatment to the village, an advantage which other mining towns do not possess. It is the intention of Mr. Dodson to have much care taken of the property, and a groundkeeper will be employed.

Mr. Dodson is a firm believer in giving the best possible surroundings and conditions to his employees and feels assured that when this is done a better class of men and better service may be expected. The work will be in charge of George S. Welsh, an architect, from Wilkes-Barre, Penn., who expects to have the plans completed by about Jan. 1, 1916. The coal operation has been recently started and a breaker, which is one of the finest in the region, has just been erected.

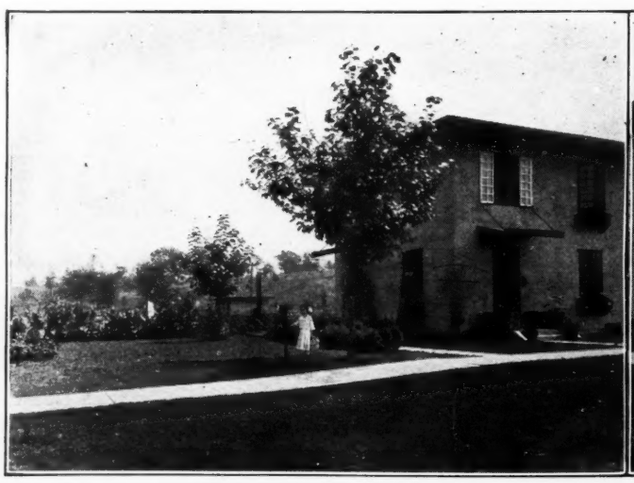
Gardens in Concrete City

At Concrete City the Delaware, Lackawanna and Western R.R. coal department gives rewards every year for the best-kept lawns and gardens. As shown in these four illustrations, the homes are better tended than many residences of the wealthy.



JOHN MARTIN'S HOUSE TAKES SECOND PRIZE

JOHN P. EVANS TOOK FIRST PRIZE FOR THE TASTEFUL GARDEN AND LAWN SETTING WITH WHICH HE ADORNED HIS HOUSE



JOHN ALLEN'S LAWN DRAWS THIRD PRIZE

FOURTH PRIZE IS AWARDED TO WILLIAM WRIGHT

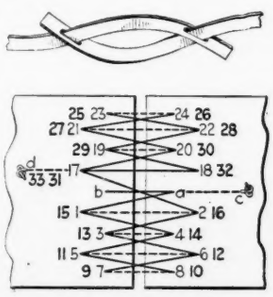
Discussion by Readers

Mining Machinery--Belting

Letter No. 3—I have used a somewhat similar method of lacing belts to that described by "Chief Electrician," *Coal Age*, Aug. 7, p. 227, but differing from his in two particulars.

First, I prefer to begin the lacing of a belt in the center rather than on the edge; and, second, I do not find it necessary to tie the ends of the lace, further than to make a simple knot, as illustrated in detail in the accompanying figure. By starting and finishing the lacing at the center of the belt, the ends of the lace, if they come loose, do not strike passersby or flap against the guardrails. I have always had some difficulty in keeping the ends of a lace tied unless a large and unsightly knot is made.

Referring to the figure, I have numbered the holes in the belt in the order in which the lacing is passed through them, except the two center holes *a* and *b* and the outer holes *c* and *d*, used for knotting the ends. The general position of the holes is the same as that previously described in Letter No. 1.



LACING A BELT

The method of lacing I prefer is as follows: First, to secure one end of the lacing, it is run through hole *a* from the top and carried underneath to hole *b*; this is repeated by running the lace again through holes *a* and *b*. The end is then carried down through *a* and up through *c*, and a simple knot is tied in the end of the lace on the upper side of the belt, as shown in the figure.

Now, taking the other end of the lace, it is passed down through hole 1, up through 2, down through 3, and up through 4, continuing this order to the side of the belt. The lace is passed twice in succession through the holes at the side of the belt, as indicated by the numbering of the holes. Emerging from hole 10, the lace is carried down through hole 11 and up through 12, this order being continued until it emerges from hole 16, when it is carried across the center, missing holes *a* and *b* and run down through hole 17 and up through 18. The same order is continued across the other side of the belt and back to 31 and 32, and finally passed down through 33 and up through the outer hole *d*, where a knot is tied on the upper side of the belt, in the same manner as before.

By this method the lacing presents only parallel lines on the side of the belt next to the pulley, as indicated by the dotted lines in the figure. The full lines in the figure show the lacing as it appears on the upper side of the belt.

The small detail sketch just above the belt, in the accompanying figure, shows a good method of tying together two ends of the lacing, should this be necessary. I may add that the first line of holes in each end of the belt may be set back a short distance sufficient to permit of the ends of the belt being cut off should the belt be required to be shortened at any time.

GEORGE N. LANTZ.

New Straitsville, Ohio.

[There is one point in which the order of lacing described by correspondent is open to criticism. Let someone suggest what this is and how the order of lacing could be slightly changed to avoid the difficulty. Also, state what would be the tendency of a belt when laced in the order here described.—Editor.]

New York Coal Specifications

The issue of *Coal Age*, July 24, p. 132, contained an interesting account of new coal specifications that are to be adopted shortly by the New York City departments. Almost at the beginning of the article an admission is made that the City pays more per ton for a certain grade of coal and secures a poorer quality than certain individual consumers. If observation has brought such a situation to light, it would be the part of wisdom to learn the cause before attempting a remedy. But the article to which I have referred seems to indicate that the city authorities concluded that the fault lies in the specifications and proceeded to correct them. Just how the city expects to lower the price of its coal by elevating its specification standards is difficult for a novice to comprehend.

It is not intended to criticize the transposition of the buckwheat sizes; information has been ample to have justified such a correction years ago. Neither is it the purpose to analyze the new specifications and assemble their inconsistencies. Reference might be made in passing, however, that the "premium" hook is not well baited. For instance, deductions made for excess moisture will not be remitted, although the major tonnage in a given contract may fall materially below the percentage of moisture permissible. Then again, "the total offsetting tonnage shall never exceed the tonnage deductions on the 1-per cent. basis for ash and B.t.u."

In spite of all issues in detail, interest clings to the fact that the city is not a successful buyer in a field where the most talent seems to be concentrated. It is rarely able to secure widely competitive bidding. Some dealers are suspicious of the mechanism of "specifications" in the hands of officials. A superintendent of one of the city departments once admitted to the writer, in explanation of heavier penalties having been imposed in one borough over other districts, that the dealer holding the contract in that borough did not have the good-will of "the boys" and they took advantage of every condition against him. The undeniable inference is that "the boys" were lenient in favored cases. There has been also much criticism, and not without some justification, against the work of the Central Testing Laboratories

upon which the city departments depend for their reports of fuel efficiency. The Department of Education requires the dealer to transport and set up cumbersome portable scales at delivery points. Supervision at the dealer's scales would be quite as efficient and cheaper.

But thoughtful consideration of the specification method of purchasing anthracite coal when such a contract cannot secure support from the source prompts one to ask this question, What would be the effect if all buyers of anthracite coal were to impose conditions similar to those adopted by the City of New York? All the anthracite steam coal available for this market is sometimes barely sufficient for the requirements. If one customer or a selected few are to be given the right of choice, they should expect to pay a premium. But is it moral to give preference to a few, in return for a bonus, and serve the balance of the trade at usual prices with the "left-overs"?

M. GIBBS.

——, Penn.

Preventing Mine Explosions

Letter No. 8—I have been much interested in reading the several letters on this subject. In my opinion two main things are necessary in order to reduce the possibility of an explosion occurring in a mine generating gas: First, all mining operations and mine workers should comply with the law in a true sense. Second, mine officials should use sound judgment in respect to every detail of the work, especially the ventilation of the mine in their charge. If these two points are strictly observed, I think it would go far toward eliminating mine explosions.

There are, however, weak points in the bituminous mine law of Pennsylvania (1911), and I will draw attention to some of these which occur to me. Art. 9, sec. 1, of the law requires an air volume of 200 ft. per man per min., and sec. 2 permits 70 men to be employed on a single air split. This makes it necessary to circulate 14,000 cu.ft. of air per min. in a split where the full quota of men is employed. The law is deficient, however, in that it makes no mention whatever of the area ventilated by this split.

Suppose, for example, the split ventilates three butt headings. The air volume required by law (14,000 cu.ft. per min.) is ample when these headings are being driven up and rooms are turned. As the rooms are finished, however, and the work of drawing back the pillars is started, conditions change. Heavy falls of roof occur, and more gas is generated, often suddenly. The air current becomes more charged with gas and may reach the danger point at any time, but the worst is yet to come. The number of men employed in this section is soon reduced to, say 30 men. With this number of men the law requires only an air volume of 6000 cu.ft. per min., which is insufficient in most cases for the proper dilution of the gas given off.

Perhaps there is another section adjoining this one, also drawing back the pillars, and it is decided to throw these two sections into one, employing a total of 40 men and ventilating that section with a current of 8,000 cu.ft. per min. In this case the danger is much increased. The air circulating through this larger area becomes heavily charged with gas, and a blownout shot, with a slight quantity of coal dust thrown into the air, is enough to cause a mine explosion.

Here is where the sound judgment of mine officials must be exercised. The requirements of the law are insufficient for the practical needs in the mine. I recall one case where from 23 to 30 men were working in a certain section generating gas. The law required a current of only 6000 cu.ft. per min. in this section. Instead of that, however, there was an air current of from 18,000 to 26,000 cu.ft. per min. circulated in this split, so as to keep the place safe for work. This air current was circulated around some worked-out and abandoned places, containing old gobs. The instance I have cited is no exception in this state.

Another dangerous condition arises in the use of open lights on the return airways of pillar workings. This is prohibited in art. 10, sec. 1, of the bituminous law. But often sufficient precaution is not taken to prevent open lights from being carried into such places. The safety lamps required in pillar work frequently become an element of danger when an unexpected fall drives a quantity of gas down on the lights. Too often a safety lamp is regarded as providing the necessary protection against the gas generated in the workings, but the test may prove too severe and the lamp must be carefully guarded.

In the effort to prevent the occurrence of mine explosions, all gobs should be ventilated directly into the return airway. No open lights should be permitted to enter the return of any section where roof falls are frequent. No electric pumps or wires should be allowed in the return of pillar work. Wherever possible, doors should be avoided, as a door is a very uncertain thing in the ventilation of a mine. Whenever a small air current is passing through an extended section of a mine it should be carefully watched. As a further precaution, permissible powder should be used and all shots should be fired with a battery.

Another practical point that must be considered in guarding against explosions is the complete removal of all the coal, not only to insure the closing of all abandoned places, but in most cases such a removal of coal will be followed by a surface break that permits the free escape of gas from the strata.

F. M.

——, Penn.

Longwall vs. Room-and-Pillar Mining

Letter No. 3—Referring to G. R. Waddell's Letter No. 2, *Coal Age*, July 31, p. 181, I observe he states that he is "a great believer in the longwall method of mining." There are many others besides, who have strong faith in the general application of longwall to the mining of coal, but Mr. Waddell seems to think that this is the one and only method whose advocates can claim that they are following the motto, "Safety the first consideration."

In my experience, I have worked in several mines where it would be absurd to apply the longwall method for the extraction of the coal. Again, I have seen that method tried in a certain mine in Northumberland, where the coal seam lay almost flat and was of a uniform thickness of 4 ft. throughout. The method, however, proved an absolute failure in this seam, which I could show by giving further

particulars, if desired. It may be claimed that there was something wrong, as probably there was; but the real trouble is to be found in the local conditions, which did not permit of a successful application of the longwall method.

I want to say that it is practically impossible to state positively that any one method of mining is the best to employ in all cases. We might as well say that a certain method of mine haulage is the best system to employ in a mine or attempt to advise what is the best boiler to use in a power plant. There are always numerous circumstances and conditions that must modify one's decision in a particular case, and this is very true in coal mining. For that reason, the only way to determine the best plan to adopt in a particular mine is to be guided by the conditions on the ground, and even then the development must be carefully watched to observe the success of the method employed.

Mr. Waddell states that he does not think that "there is any record of an explosion occurring in a longwall mine." I want to draw his attention to the following list of fatal mine explosions, all of which were in mines worked by the longwall system:

Sept. 11, 1878, Ebbw Vale colliery, Abercarne	268
Jan. 13, 1879, Dinas pit, Rhondda Valley	63
July 15, 1880, Risca mine, near Newport	120
Dec. 10, 1880, Penygraig, South Wales	101
Dec. 23, 1885, Mardy colliery, Pontypridd	81
Feb. 6, 1890, Llanerch colliery, Abersychan	176
Mar. 10, 1890, Morfa colliery, Glamorgan	87
Aug. 26, 1892, Park Slip colliery	112
May 24, 1901, Universal colliery, Senghenydd	81
Mar. 10, 1905, Clydach Vale	33
July 11, 1905, Wattstown colliery	119
Oct. 14, 1913, Universal colliery, Senghenydd	427

All of the explosions recorded above occurred in mines located in a single coal field, where the longwall method of mining was thoroughly understood. I have worked in mines employing almost every system of mining known, and if asked which of these methods would be the best for general adoption, I would be compelled to say that I could not answer that question without making a careful study of the conditions existing in the mine.

R. J. Brown.

Fernie, B. C., Canada.

Operations in Longwall

Letter No. 1—Referring to the answer to an examination question asking for a description of the operations in advancing a working place in a longwall face, *Coal Age*, Aug. 14, p. 272, I want to suggest one or two points in which my experience of six years as a mine official in longwall work differs from the method outlined in this letter.

After explaining the duty of the miner to examine carefully the condition of the roof and face of the coal and to reset any timbers that may have been displaced by the falling coal during the night and then proceeding to load the fallen coal, the answer goes on to say, "Having loaded all the fallen coal and cleaned up the face, any new timbers required should be set in position."

I would say that a longwall miner must not clean up all his coal before he sets any new timbers. These should be set as soon as there is room for them. They should be set 4 or 5 ft. apart, as the work of cleaning up the coal proceeds. If the miner waits until he has cleaned up all his coal, he is bound to be working under a great area of unprotected roof. Longwall work is subject to sudden breaks, and it is necessary to keep the face well timbered in order to guard against falling roof.

The answer now goes on to say, "The work of undermining the coal should then be commenced, setting the necessary sprags and timbers as this work proceeds." I would suggest that the miner should set sprags along the coal face before commencing to undermine the coal, so as to keep in place any loose coal that may fall. Miners have been slightly injured at times by small pieces of falling coal because they have not set these sprags before starting to undermine the coal.

The answer further states, "Before leaving the place for the night, the miner draws all sprags or other timbers supporting the coal at the face, so as to permit the gradually increasing roof pressure to break down the coal during the night." I want to ask, How is a mine examiner to examine the coal face for breaks or bad top when the coal is not supported? In my experience the miner leaves his place at night well timbered, and his coal if undermined should be well spragged, so that the mine examiner can make a careful inspection of the working face for gas, open breaks in the roof or loose top, with safety. After the miner has examined his place in the morning and set any necessary timbers to make it safe, he should take out his sprags one or two at a time. He should load the coal that falls and set more timber before taking out the other sprags and loading more coal. By so doing he will never be working under a great area of unsupported roof, but his place will always be well timbered.

Assistant Mine Foreman.

Sullivan, Ind.

[We are glad to have correspondent draw attention to his experience and practice in longwall work. Much depends on the toughness and yielding nature of the roof. There should always be maintained a systematic system of timbering in which the posts are set from 4 to 5 ft. apart in rows paralled to the working face. The posts standing in the row next to the face are liable to be dislodged by the falling coal, and these must be reset before any attempt is made to load coal. In loading out the coal from the longwall face it is necessary to keep the space between the first row of timbers and the face of the coal clear, so that the coal can be transported to the head of the road. When working longwall under a frail roof all that the correspondent has said is true and should be observed. The time of drawing the sprags depends on the length of time required to break the coal. This depends again on the nature of the roof, depth of cover, thickness of the seam and hardness of the coal.—Editor.]

Mining Laws and Legislation

Letter No. 10—I have been much interested in the discussion of the responsibility of the assistant mine foreman, and particularly in the case cited by Oliver Young, in letter No. 7, *Coal Age*, Aug. 7, p. 229. The instance given is one in which a miner was killed by a fall of rock or slate after he had been notified to set the timbers required to make the place safe. Failing to obey these instructions promptly, the miner was killed by a fall which took place shortly after the instructions were given.

Mr. Young asks, "Can this assistant foreman be held responsible for the neglect of the miner, after having

given him instructions to make his place safe?" and cites the Pennsylvania bituminous law which makes the miner responsible for the safety of his working place and compels him to keep it in a safe condition or to cease work and inform the mine foreman or the assistant foreman of the danger.

In my opinion the responsibility for the safety of a workman rests equally on the workman himself and on the foreman or the assistant foreman in charge of that section. If the miner knew of the bad condition of his working place before being notified or continued to work there after he was notified of such condition, he is responsible for his own neglect or delay in making the place safe.

It seems to me that in this case, however, the assistant foreman was in part to blame for this accident because he did not remain long enough to see that the miner started to obey his orders and set the necessary timber. Instead of walking away after giving this order, he should have satisfied himself that the work would be done or he should have brought the man out and fenced the place off and prosecuted him for his neglect to obey promptly the order given. Had he done this, the miner would have been alive today.

I would ask, What are the duties of the assistant mine foreman in charge of a section of a mine? Evidently he is placed in charge of that section for the purpose of making it safe for work. He is supposed to visit all working places in his charge once or twice a day. In case he finds a place that is dangerous and cannot be made safe at once, it is his duty to withdraw the men working in that place and fence it off until it can be made safe for work. The assistant foreman's motto at all times should be, "Safety First." If an assistant foreman finds his section is too large for him to give proper attention to each working place therein, he should appeal to the boss for help.

Like Oliver Young, I am a firm believer in a uniform system of timbering, but am sorry to say that too many miners are opposed to this plan, preferring to set timbers where they think they are needed, and too often they do not discover the need until too late. Many times I have had to fence off places owing to bad timbering. In most cases miners when left to themselves will not set timbers until the place actually becomes dangerous. My motto is, "If a place is safe, keep it safe by systematic timbering, and don't wait until the roof becomes dangerous before setting timbers." If this rule was followed, there would be fewer accidents from falls of roof and slate.

JACOB RILEY.

Sullivan, Ind.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

PRACTICAL PROBLEMS

Example—A current of 25,000 cu.ft. per min is passing in a shaft mine. The shafts are 8x12 ft. in section and 250 ft. deep. The airways are 6x10 ft. and 15,000 ft. long, including the return. (a) What is the water gage due to this circulation? (b) Assuming the power applied to the fan shaft remains unchanged and the current is divided into two equal splits, at a point 3000 ft. inby from the foot of the shaft, what volume of air may be expected to be passing; and (c) what will be the water-gage reading on the fan drift and at the bottom of the shaft, after splitting?

Solution—The rubbing surface and sectional area of the shafts and airways are, respectively, as follows:

		Sq.Ft.
Shafts—		
Rubbing surface	$2(8 + 12)2 \times 250 =$	20,000
Sectional area	$8 \times 12 =$	96
Airways (total)—		
Rubbing surface	$2(6 + 10)15{,}000 =$	480,000
Sectional area	$6 \times 10 =$	60
Main airway—		
Rubbing surface	$2(6 + 10)3{,}000 =$	96,000
Sectional area	$6 \times 10 =$	60
Two equal splits—		
Rubbing surface	$2(6 + 10)12{,}000 =$	384,000
Sectional area	$2(6 \times 10) =$	120

The relative part potential factors are then:

Before splitting—

Shafts	$\left(\frac{1}{X}, \frac{1}{X_p{}^2} \text{ or } \frac{1}{X_u{}^3}\right) = \frac{s}{a^3} = \frac{20{,}000}{96^3} =$	0.0226
Airways (total)	$= \frac{480{,}000}{60^3} =$	2.2223
General relative mine potential factor $\left(\Sigma \frac{1}{X}\right)$		2.2449

After splitting—

Shafts (as before)		0.0226
Main airway	$\frac{1}{X} = \frac{s}{a^3} = \frac{96{,}000}{60^3}$	0.4444
Splits	$= \frac{384{,}000}{120^3}$	0.2222
General relative mine potential factor $\left(\Sigma \frac{1}{X}\right)$		0.6892

(a) **Water gage** (before splitting)—

$$w.g. = \frac{1}{5.2}\left(kQ^2 \times \frac{1}{X_p{}^2}\right) = \frac{0.00000002 \times 25{,}000^2 \times 2.2449}{5.2} = 5.4 \text{ in.}$$

(b) For a constant power on the air, the quantity varies as the cube root of the mine potential; but, for a constant power applied to the fan shaft, owing to the efficiency of the fan varying inversely as the 3/5 power of the potential X_u, the quantity varies as the 4/5 power of that potential.

The Coal Age Pocket Book

The mine potentials, in this case, are,

Before splitting— $1/X^3_{u1} = 2.2449$; and $X_{u1} = \frac{1}{\sqrt[3]{2.2449}} = 0.7637$

After splitting— $1/X^3_{u2} = 0.6892$; and $X_{u2} = \frac{1}{\sqrt[3]{0.6892}} = 1.1321$

Then, for a constant power applied to the fan shaft, the quantity of air in circulation varies as the 4/5 power of the power potential, which gives for the circulation after splitting

$$Q_2 = Q_1\left(\frac{X_{u2}}{X_{u1}}\right)^{\frac{4}{5}} = 25{,}000\left(\frac{1.1321}{0.7637}\right)^{\frac{4}{5}} = 34{,}250 \text{ cu.ft. per min}$$

(c) **Water gage** (after splitting)—In the fan drift the gage is

$$w.g. = \frac{0.00000002 \times 34{,}250^2 \times 0.6892}{5.2} = 3.1 \text{ in.}$$

To find the gage at the shaft bottom it is necessary to deduct the potential value for the two shafts from the total poential value for the mine after splitting; thus

$$\frac{1}{X} - \frac{1}{X_0} = 0.6892 - 0.0226 = 0.6666$$

Then, since the gage is proportional to this potential factor, the gage at the bottom of the shaft is

$$w.g. = 3.1 \times \frac{0.6666}{0.6892} = 3.0$$

Relative Variation of Factors—The following relation of some of the more important factors in the ventilation of mines by means of centrifugal fans is based on the results of many experiments:

Power on Air Constant (KU = u)—

Unit pressure,	p	*varies as*	Q^2
	p	*varies as*	$\sqrt{X} = \sqrt{\frac{a^3}{s}} = a\sqrt{\frac{a}{s}}$
Quantity,	Q	*varies as*	$\sqrt[3]{X} = \sqrt[3]{\frac{a^3}{s}} = \frac{a}{\sqrt[3]{s}}$

Power Applied to Fan Shaft Constant (U)—

Efficiency,	$1/K^5$	*varies as*	$X_u{}^3 = X_p{}^2 = X = a^3/s$
	K^5	*varies as*	n^3
Effective power,	u	*varies as*	K
Quantity,	Q^5	*varies as*	$X_u{}^4$
Speed,	$1/n$	*varies as*	X_u

Mine Potential Constant ($X = a^3/s$)—

Effective power,	u	*varies as*	Q^3
Quantity,	Q^5	*varies as*	n^4
Water gage,	$(w.g.)^5$	*varies as*	n^8
Speed,	n	*varies as*	U, practically
Efficiency,	K^5	*varies as*	n^7

Inquiries of General Interest

Working Thick Inclined Seams

I wish to inquire how you would mine an 86-ft. seam of bituminous coal having an inclination of 18 deg. with the horizontal.

S. P. Dickinson.

San Francisco, Cal.

Illustrations of such mining are to be found in the St. Etienne coal field of France, where seams of varying thickness and inclination occur. One of these, the Grand Couche, is 82 ft. thick in places and has an inclination varying from 30 to 90 deg. This seam is reached by cross-measure drifts driven from a vertical shaft to strike the seam. When these cross-tunnels reach the middle of the seam horizontal levels are driven to the right and left on the strike of the measures. The seam is then divided into panels by driving inclines about 400 ft. apart, center to center. These are driven up the pitch to strike the level of the lift above. A similar incline is then driven up the center of each panel. These inclines are driven on the full pitch and about in the middle of the seam.

The coal lying in the seam between two consecutive lifts is now divided into, say four or five equal stages, each stage being worked separately in about five substages, the substages having each a height of 6 or 7 ft. for convenience in timbering. The stages are worked in order, from the top of the panel downward, the upper stage being about one-third worked out when the stage next below is started. The substages are worked in order from the bottom of each stage upward, until the coal in that stage is exhausted.

The method of extraction in each stage is as follows: Beginning at the bottom of the upper stage of the panel, crosscuts are driven from the center incline horizontally across the seam. The work of extraction is then begun, simultaneously, at the head of each of these crosscuts, by driving levels to the right and left the entire width of the panel, a distance of nearly 200 ft. As these levels advance, they are followed by other levels in succession, the head of each level being a few yards in advance of the next one outby. This creates a stepped longwall face in each half-panel, which is worked out on the retreating system. The entire coal in this substage is thus taken out back to the middle of the seam, the space being built in with refuse or filling brought from the surface, as the work proceeds.

The work on the next substage above is commenced by driving crosscuts, as before, in both directions from the center incline; but these crosscuts are driven a little to one side of the crosscuts below, so as to rest on the coal not yet taken out and on the refuse in the worked-out portion below. In this manner the substages are worked out successively, the coal being replaced by material brought from the surface or by the refuse of the seam. While at work the miners in each substage above stand on the refuse or building in the substage below. The filling of this refuse must be done in a careful manner. The packwalls must be built as solid as it is possible to make them. In the system here described, the work of extraction is being carried on in three successive stages at the same time.

In the case cited by correspondent and illustrated in the accompanying figure, it may be assumed that the seam outcrops on the property. In that case the mine should be opened by an incline or slope driven in the middle of the seam. The accompanying figure is a diagram and shows but a single main slope driven in the middle of the seam. This is shown in cross-section on the right and in elevation on the left. It is advisable, however, to drive three or four parallel slopes, the center slope or slopes being used for haulage, while those on either side are employed for manways, ventilation and drainage. The same system may be employed as that just described and in use in the French mines.

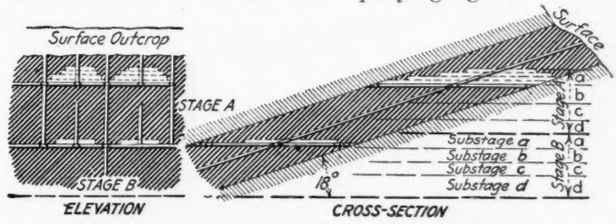


DIAGRAM SHOWING METHOD OF WORKING THICK INCLINED SEAM

In the figure two stages are shown, the upper being stage *A* and the lower stage *B*. Each of these stages is divided into four substages, marked *a, b, c, d.* The development in the upper stage is shown as having progressed further than that in the lower stage.

The seam is first divided into panels by driving the main slopes from the outcrop, about 400 ft. apart. These slopes are driven in the middle of the seam and correspond to the main inclines previously described. The panels are now completed by driving levels or lifts on the strike of the seam, at certain specified distances apart. Inclines are driven up the center of each panel, as indicated in the elevation on the left.

Now, beginning at the bottom of the upper stage in each panel, level crosscuts are driven, as previously described, in both directions from the center incline. The work of extraction is begun at the head of each crosscut by driving levels to the right and left across the entire width of the panel. Other levels follow these, as has been described, the face of each level being a few yards behind the one preceding so as to form a longwall face on the retreating plan.

The success of the method here described depends to a very large extent on the care and thoroughness observed in packing the space previously occupied by the coal. It will seldom occur that the refuse of the seam will be sufficient for this purpose and the necessary material must then be brought from the surface.

Examination Questions

Miscellaneous Questions

(*Answered by Request*)

Ques.—(a) What dangers arise in dusty mines from the blasting of coal and the lack of judgment in placing holes for blasting the coal? (b) Would you consider it safe to permit blasting to be done in mines generating explosive gas? (c) If so, what percentage of gas would you consider safe, and under what restrictions would you permit blasting?

Ans.—(a) The danger of blasting coal in dusty mines consists chiefly in the dust being thrown into suspension in the air by the force of the blast and the dust cloud thus formed being ignited by the flame of the powder and gases projected from the hole. The ignition of the dust causes a local explosion that may, under favorable conditions, be extended throughout the mine and cause a mine explosion. Bad judgment in the placing of shots or in the amount of powder required to charge the hole may result in a blownout or a windy shot, either of which is always dangerous in a dusty mine.

(b) When blasting coal in a mine generating explosive gas, special precautions must be taken to avoid trouble. Only permissible powders should be used, and all shots should be inspected, charged and fired by competent shotfirers after the men have left the mine. The shotfirers should use moderate charges of powder and tamp the holes with clay. They should start to fire the shots on the return end of a section of the mine and proceed in order against the air, giving time for the explosive gases and dust to be carried away before firing each successive shot. A shotfirer should refuse to fire any hole that in his judgment is unsafe. He should examine each place for gas before firing a shot therein.

(c) It is difficult to say what percentage of gas can be considered as the limit for safe blasting in mines. Much depends on the dusty condition of the mine, the fineness and inflammability of the dust, the kind of powder used, and the precautions taken in charging and firing the shots. In hard-coal mines, blasting is performed safely in 2 per cent. of gas, while in the mining of soft, inflammable coal producing much fine dust, blasting becomes dangerous when the gas falls below 1 per cent.; and it is important then to ascertain that there is no accumulation of gas at the face, before firing a shot. Under these conditions, blasting should only be permitted when all of the precautions mentioned in the last answer are observed.

Ques.—Under what conditions would the use of open lights be safe in gaseous mines, and under what conditions would you forbid the use of open lights in such mines?

Ans.—When it is impossible to prevent the possibility of gas accumulating at the working face or above falls, or in other void places in the mine, locked safety lamps should be used exclusively. Also, in mines where gas is generated in such quantities that there would be danger arising from a possible derangement of the air current for a short time, caused by the setting open of a door or an unexpected fall of roof in an airway, or other unavoidable cause.

Ques.—How would you prove that a potash cartridge is fit for two hours' work?

Ans.—If the cartridge has not been used, it would be necessary to disconnect the seals, shake the cartridge and if the contents were loose and rattled freely, it may be considered as good for two hours' work, but this can only be proved by using it for that time in an apparatus properly charged at 120 atmospheres and giving off 2 liters of oxygen per minute.

Ques.—How would you prove that the oxygen cylinder is charged sufficiently for two hours' work?

Ans.—By opening the main valve and examining the pressure gage. If the cylinder is properly charged, the gage will register 120 atmospheres or more. Then, try to determine by the water gage or meter that 2 liters of oxygen per minute is being released or given off, as 120 atmospheres at 2 liters per min. will last two hours, providing all joints are tight and there is no leakage.

Ques.—What is the last thing you would do before turning on the oxygen supply, supposing you were on the point of entering a danger zone?

Ans.—Examine all connections to determine that they are air-tight; inflate the breathing bag from the outside air: then turn on the oxygen and examine the gage and rest a few minutes until breathing is normal and obey the leader.

Ques.—When would you retire from a dangerous zone if you were one of a rescue party?

Ans.—If my apparatus was working satisfactorily, I would obey the leader, but would consider it time to retire when one-third of my oxygen was used, regardless of time or distance from fresh air.

Ques.—What is the purpose of the emergency valve or bypass and when should it be used?

Ans.—The purpose of the emergency valve or bypass is to enable the wearer to supply the breathing bag with oxygen direct from the cylinder, in case the reducing valve got out of order and failed to supply the necessary amount of oxygen required. It should only be used in cases of emergency.

Ques.—A sinking bucket is 4 ft. 6 in. deep, 3 ft. 3 in. in diameter at the top and 2 ft. 9 in. at the bottom. What is the cubical contents of the bucket, and what weight of water will it hold?

Ans.—The bucket is 54 in. deep, 39 in. across the top and 33 in. at the bottom. It is therefore the frustum of a cone, and its cubical contents is

$$Vol. = 0.7854 \times \frac{54}{3} \times \frac{39^3 - 33^3}{39 - 33} = 55{,}092+ \text{ cu. in.}$$

or $55{,}092 \div 1728 = 31.88$ cu.ft.

Since water weighs 62.5 lb. per cu.ft., the weight of water that the bucket will hold is $31.88 \times 62.5 = 1992.5$ lb., or say 1 ton.

Coal and Coke News

Harrisburg, Penn.

The Interstate Commerce Commission on Sept. 3, postponed until Dec. 1, the effective date of its order reducing freight rates on anthracite railroads. The order was to go into effect Oct. 1.

In their petition asking for an extension the anthracite roads expressed a general intention to comply with the reduction, but suggested that a complete checking of the proposed tariffs required labor and time. The commission, following its custom in important cases, decided to grant the extension. A thorough checking of the tariffs may lead to further requests for minor modifications, but it was believed here today that for the present there is no prospect of litigation by the railroads to test the order.

It is predicted here that the price of anthracite promises to be as high, or higher, this winter, and those who have postponed buying their coal in the hope of getting cheaper prices for Oct. 1 will be disappointed. The new transportation rates for anthracite entailed a cut of 10 per cent.

Railroad men connected with anthracite carriers expressed great satisfaction with the delay. According to the railroads, there has been a big falling off in earnings on anthracite transportation since the drastic decision was handed down last month. The individual consumers postponed their orders, they said, and thereby caused the retailers and jobbers likewise to curtail orders.

October and November are big months in the anthracite business. It appears now as if the railroads by getting the prevailing old rates for transportation during these two months, will practically not suffer at all this calendar year as the result of the commission's decision.

The railroads, in the order in which they will profit by the postponement of the new transportation rates are the Lehigh Valley, the Reading, the Lackawanna, Delaware & Hudson, Central R.R. of New Jersey, Erie, Pennsylvania and Ontario & Western. The assumption that a cut of 10 per cent. in the transportation rates after Dec. 1 will cause a cut of 10 per cent. in the price of anthracite to the consumer is contested by the railroads. They maintain that the public will have to pay the same prices in any event and that the gain will go wholly to the retailers and jobbers.

August was a third month of low anthracite production, although there was slight improvement over the previous month, and it is probable that the total output for the first 8 months of the year is nearly 2,060,000 tons less that for the first 8 months of last year. This will mean an anthracite shortage at certain points later in the year, as it is impossible to produce, prepare and ship the coal to market as fast as necessary unless the demand is fairly evenly distributed throughout the year.

The official figures of the amount of coal shipped to market by the initial railroads will be sent out this month from Wilkes-Barre by the Anthracite Bureau of Information, which has absorbed the Bureau of Anthracite Statistics hitherto located in Philadelphia.

While the official figures will be announced later in the month, the amount shipped to market will probably fall short of the tonnage in August 1914, which was 5,483,743 tons. From this time on the demand for anthracite should be more brisk, and both dealers and consumers will begin to stock up so as to avoid a shortage later in the season.

PENNSYLVANIA

Anthracite

Hazleton—The colliery machine shops in this region are having difficulty to keep a full complement of employees, as many of the men are being attracted by the high wages offered by plants working on war material.

Wilkes-Barre—Over 200 mine workers, principally natives of the warring European countries took the examination for certificates as miners here on Aug. 29, preferring to work in this country than to fight in Europe. While the applicants appeared eager to pass and obtain the coveted certificates only one-third of them were able to reach the required standard of knowledge that would insure the safety of themselves and fellow employees as practical miners.

Wyoming—Several hundred men and boys employed at the Westmoreland colliery of the Lehigh Valley Coal Co. went out on strike on Aug. 30, following the refusal of several workmen to obtain buttons of the union by either joining the organization or paying back dues.

Pottsville—The mines of the anthracite region still continue to experience great difficulty on account of flooding due to the excessive rainfall of the past summer. In several instances the accumulation of water has been such that the pumps at some of the collieries could not cope with it and as a result numerous shutdowns have resulted. In the vicinity of Shenandoah City the pumps could not begin to keep the water down and as a consequence a number of these machines were submerged. New pumps have been sent in and are being installed as rapidly as possible. Men of long experience in mining state that the continuous high water is the worst in the history of the region, and is costing the operators heavily.

Plymouth—All of the collieries of the Wyoming Valley are operating on nearly full time, the demand for coal being good. Collieries of the Delaware & Hudson Co. have been operated on good time for several weeks past, the Plymouth division producing an unusually large amount of coal. The breaker at No. 5 colliery has been closed for repairs for several weeks, but coal produced at this colliery is being prepared at No. 2 breaker at which double time is the rule. Several hundred mine workers at No. 5 colliery of the same company at Parsons will be thrown out of work until Nov. 1, by the closing of this colliery. Repairs will be made to the breaker and the capacity will be increased so as to care for the coal taken from the Baltimore tunnel. While repairs are being made at Baltimore No. 5, the coal mined at No. 5 will be prepared at the Baltimore Tunnel breaker which will be abandoned after Nov. 1.

Bituminous

Bradenville—The No. 1 mine of the Atlantic Crushed Coke Co., near Bradenville, Westmoreland, Co., Penn., has reopened in full after a long shutdown. The Atlantic company also expects to resume operations at its No. 3 mine. With the opening of these two mines the Atlantic company will have in full operation three plants as the big New Derry plant is operating with as many men as can be had. The Duquesne plant of the Bradenville Coal & Coke Co. at Bradenville is running full. Numerous and extensive improvements are being made at this plant.

Uniontown—Charles Ford, of Jefferson Township, Fayette County, Penn., has sold to the H. C. Frick Coke Co. ten acres of coal underlying his farm for $800 per acre. A large portion of the $8,000 consideration was paid in cash on the consummation of the deal. The property is located near Braznell.

Connellsville—The coke production of the Connellsville region recently rose to 391,000 tons per week, being a gain of approximately 9,000 tons over the previous week. Merchant ovens are now operating up to the average of 1913 which was one of the best years in the coke business.

Charleroi—The Hazel Kirk and Dunkirk mines of the Pittsburgh-Westmoreland Coal Co. at Charleroi recently resumed operations, giving employment to about 400 men.

Altoona—The Pennsylvania R.R. Co. is using every inch of available space in this district for the storing of fuel. Great piles of coal containing thousands of tons are being stored at South Altoona and at the lower end of the yards, and it is believed that the Pennsylvania will continue to store fuel until all available space is filled. Precautions are being taken to pile the coal in such a manner that the danger of spontaneous combustion will be reduced as far as possible. Other large railroads are storing coal but Altoona is the principal storage place in this district for the Pennsylvania system.

WEST VIRGINIA

Clarksburg—The Consolidation Coal Co. recently paid its miners for work done during the first half of August. This pay in the Clarksburg district amounted to $50,000, but was not considered a heavy payroll. Difficulty has been experienced in securing enough cars and boats to take care

of the tonnage. This condition has been bettered somewhat, and September tonnage promises to be heavy.

Huntington—The August loading of the Chesapeake & Ohio R.R. totalled 2,420,630 tons, as against 2,232,305 tons in July. It had been anticipated that the August loadings would reach the 2,500,000 ton mark, and the actual loading was a close approximation to this figure. At the present rate of increase, the total tonnage for the current fiscal year will reach approximately 25,000,000 tons. Usually the coal loading falls off after July and August, but this year some operators affirm that the new pace is to be maintained, and that the total for the fiscal year ought to be nearer 30,000,000 tons than 25,000,000 tons.

VIRGINIA

Lynchburg—Trial of 17 ejectment cases instituted in the Federal district court here against 1,200 defendants, by the Virginia-West Virginia Coal Co., of Charleston, W. Va., will begin shortly. The plaintiff is seeking to oust occupants of coal lands to which it claims the title, occupancy dating in some instances as far back as the Civil War. By agreement, two cases will be tried as test cases, and judgment will be entered in the others accordingly.

ALABAMA

Birmingham—A bill has been introduced in the legislature by Mr. Rogers, of Sumter County providing for the working of convicts in the development of the coal mines owned by the University of Alabama, and that an appropriation of $250,000 be made to establish a system of mining the coal lands of the University. The school owns a large quantity of coal lands along both sides of the Warrior River, and the opening of lock 17 gives access to the sea.

KENTUCKY

Louisville—The Harlan Coal Mining Co., of Louisville, has had a successful contest under way whereby dealers are being interested in the choice of a name to be used by the company in connection with its leading domestic coal, mined in Harlan County, Ky. The company offered a car of its coal as the prize for the winning suggestion. A great many dealers submitted names, and the contest will be hard to decide. The company has announced that in order to permit additional names to be submitted, the date for closing has been changed from Sept. 1 to Sept. 15. As the coal market is rising at present, the value of the prize is also ascending, and competition for it is naturally keen.

The Cumberland Telephone and Telegraph Co., with headquarters in Louisville, has begun the construction of an important long distance line from Hazard to Jenkins, Ky. The line will be by way of Cornettsville, Blackey, Whitesburg, Kona, Seco, Fleming and McRoberts. At present the Elkhorn and Boone's Fork coal fields are entirely out of reach of Louisville by phone, and the extension will prove of great value to all those interested in the coal industry.

Hazard—One of the best indications of improved coal business in eastern Kentucky is the fact that a car shortage has made its appearance in that district. Operators on the Louisville & Nashville report that they are having trouble getting sufficient cars, and their neighbors in West Virginia are also experiencing a similar shortage. The mines are running five or six days a week, and the demand is so good that the railroads are having trouble taking care of the business.

OHIO

Coonville—Reports indicate that the mine near here, which is and has been for some time in the hands of a receiver, will shortly be reopened, in order to take advantage of the fall and winter business.

Columbus—One of the features of the Ohio State Fair, recently held at Columbus, was the display of the efficiency of mine rescue apparatus by the Ohio Mining department. Under the direction of Chief Inspector J. M. Roan, a deputy entered a glass cage with two guinea pigs. Equipped with the apparatus the deputy was able to withstand carbonic acid gas while the guinea pigs suffocated.

The New York Coal Co. has filed two suits against the Sunday Creek Coal Co. in the Franklin County courts to collect $13,116 and $20,000 respectively on royalties claimed to be due for coal mined, calculated on the basis of 10c. per ton.

Lost Run—The Essex Coal Co., of Columbus announces that coal will be loaded from the new mine at Lost Run in Hocking County shortly. Another opening is being made within a mile of the Lost Run mine, which will be in operation in 30 days. Each of the new operations will have a capacity of 800 tons daily.

West Wheeling—The West Wheeling Coal Co.'s mine, which has been working only about 25 men, is ready to resume in full with promise of a steady run. When working to capacity this mine employs about 100 men.

Blairsville—The Graff Bros. are operating all their mines to their full capacity, and it is stated that they could use 300 more miners at the present time. The total capacity of these mines is about 7,000 tons per day.

Athens—Officials of the Pittsburgh Coal Co. recently announced that Mine No. 10 would begin operations shortly. This mine has been idle for nine months, and will employ about 300 men. Other mines around the city, except those of the Sunday Creek Co. are working well.

ILLINOIS

Oliver—The people near Oliver who have given coal leases on their land to the Coal Hill Coal Co. were recently notified that the leases were to be transferred to the St. Marys Coal Co., which would buy the coal rights at once, with the intention of developing the field.

Lenzburg—An involuntary petition in bankruptcy has been filed in the United States District Court at Danville, Ill., against the Tirre Coal & Mining Co. of this place. The petitioners are Mrs. Mollie E. Tirre and F. E. Tirre, both of St. Louis, and William F. Zager, of Lenzburg. Mrs. Tirre alleges that she loaned the company $14,441. F. E. Tirre says the company owes him $1,680 and is unable to meet its obligations. Adam Karr, Theodore Karr and Fred Engelke, of Belleville have obtained in the Circuit Court at that place a distress warrant against the company on the allegation that it is indebted to them $1,727.69 for rents and royalties.

MONTANA

Great Falls—A petition has been filed in the district court by the Brown Coal Co. of Sand Coulee, asking that the court grant an injunction restraining William Pattkovitch and his wife, Mary, from interferring with the plaintiff or its employees. The petition alleges that Pattkovitch and his wife have threatened the lives of the plaintiff's employees for trespassing on the land they are farming. The company claims to have leased the land from the owner, who reserved the surface rights, except to permit the necessary operation of the coal. Pattkovitch and his wife drove the agents of the company from the land.

WASHINGTON

Seattle—At a recent meeting in Seattle of 75 per cent. of the coal producers of the state, the Coal Producers Association was organized. The object of the association is to increase the demand for coal produced by the mines of Washington, actively campaign for the extended use of coal and to promote legislation that will result in restoring the duty on foreign coal brought into this country, or put it on the same basis as that imposed on shipments of coal from this country into foreign countries, to conduct negotiations with various railroads looking to the securing of equitable rates to all points and on all railroads, particularly as compared with freight rates from other states or foreign countries into this state. It is expected that all the small as well as the large coal operators of the state will become active members. The mines of Washington, it is asserted, have not been working more than half time during the past year owing to general depression of business and the introduction of oil during the past few years. The matter of extensive advertising by the association, through magazines, newspapers and billboards of the advantages of the use of local coals and the support of home industries, to offset the heavy advertising of British Columbia coals, was discussed and arrangements made for an assessment of the Washington coal companies to raise a sufficient sum to cover the state with advertising next year.

FOREIGN NEWS

Amsterdam, Holland—It was recently reported that the miners in the Charleroi district and in Hainaut, Belgium, have ceased their strike and returned to work. The demand of the miners for increased wages was granted, the employers steadily refusing the offer of intervention by German soldiers.

PERSONALS

John Harshman, formerly superintendent for the Tower Hill-Connellsville Coke Co., is now superintendent for the W. J. Rainey Co., at Mount Braddock, Penn.

Charles H. Crocker, of Johnstown, Penn., was recently appointed mine inspector by Governor Baumbaugh. He will assume his duties Sept. 18, with headquarters in Blairsville, and will have charge of the new field in district No. 13, including part of Indiana and Westmoreland Counties.

Kenneth Ream, a 12 year old boy from mine No. 38, Seanor, Penn., carried off the individual prize in the Berwind-White employees' first aid contest held recently. Young Ream was entered in the problem contest set by the Du Pont Powder Co. and won over much older and more experienced competitors. The prize was a solid gold scarf pin.

INDUSTRIAL NEWS

Birmingham, Ala.—Wage workers of the bankrupt concern known as the Wadsworth-Cahaba Coal Co., who were preferred creditors recently received 50 per cent. of the money due them. There were 94 such creditors, the amount due being $2,500.

New Orleans, La.—It is stated that the Pratt Consolidated Coal Co. of Birmingham, represented in this city by the New Orleans Coal Co., will before long put into operation a through barge service from the Alabama fields to New Orleans.

Philadelphia, Penn.—A cargo of coal was recently shipped from Philadelphia to Africa, carried by the British steamship "Strathgarry," clearing from this port for Algiers. The cargo was valued at $17,955.20 and was loaded at the Greenwich coal piers.

Hickman, Ky.—After considerable delay due to protests filed by consumers at Hickman, Ky., and other points, the Nashville, Chattanooga & St. Louis R.R. has been permitted to make effective increases in the rate from mines on its road to Hickman from $1.20 to $1.50.

St. Louis, Mo.—Members of the St. Louis Coal Club were the guests recently of the M. W. Warren Coke Co. and inspected the new $2,000,000 by-product coke plant of the company, now in operation at Corondelet, on the Mississippi River, in the southern part of the city. The Warren company's product is becoming a formidable competitor of anthracite. It is handled by most of the St. Louis dealers.

New Orleans, La.—Six 500 ton barges are being built at Slidell, La., by the Salmen Brick & Lumber Co., for Henry DeBardeleben, head of the W. G. Coyle Coal Co. of this city, to transport Sipsey coal from Cordova to Mobile and thence to New Orleans. Other coal companies operating in the New Orleans territory are considering the establishment of barge lines from New Orleans to the coal fields of Alabama.

Great Falls, Mont.—A hearing was held here recently by the Montana Railroad Commission, upon the petition of the Nelson Coal Co. for better rates for their product from Sand Coulee over various lines of the state. The Commission has been petitioned to grant from 30 to 40 days during which time the various parties to the hearing will file their briefs. A decision on the matter will not be forthcoming for several weeks.

Philadelphia, Penn.—The Pennsylvania R.R. Co.'s supply of empty coal cars has been insufficient to meet the demands put upon it for the storage of cars of bituminous coal in desired quantities along its lines. Accordingly great piles of coal are being made at various points between Philadelphia and Harrisburg and on the middle division east of the soft coal region. These heaps of coal far surpass anything of the kind ever seen in Pennsylvania before.

Middlesboro, Ky.—The Louisville & Nashville R.R. has added another through freight crew from Corbin to Norton. This brings the total number of crews up to any previous record. Most of the coal mines in the Middlesboro district are operating five to six days per week, as against an average of less than three days for several months. Mines producing commercial coal have plenty of contracts and some are refusing contracts running over long periods.

Philadelphia, Penn.—The owners in this city have been advised that the coal barge "J. B. Walker," which left here a few days ago with a cargo of anthracite for Portsmouth, N. H., was compelled to put into the Delaware Breakwater on account of bad leaks developing, which together with serious trouble to the pumps endangered the vessel. It is expected that it will be necessary to beach the boat, as it has not been found possible to decrease the amount of water in her hold.

St. Louis, Mo.—The Missouri, Kansas & Texas Ry. Co., with headquarters in this city, has let a contract to Dorset Carter, of Oklahoma City, Okla., for 800 cars of coal a day. Machinery is being installed at Lehigh for stripping the coal. For this purpose one of the largest steam shovels ever made is to be used. Its capacity is 7 cu.yd. The land from which the coal is to be taken is five miles from Lehigh. The strip pit is three and a half miles long. A railroad spur has been built from Lehigh to the field.

Rockport, Ky.—A movement has been started in the western Kentucky coal district to construct a highway from Beaver Dam to Central City, and to call it the duPont Highway, in honor of one of the leading owners of coal mining properties in the district. The managements of the coal companies along the route of the proposed road are much interested in the movement, and a meeting was held at Rockport, Ky., Sept. 4 for the purpose of completing details of the project.

Frankfort, Ky.—The Kentucky Railroad Commission has decided to approve coal rates on the Chesapeake & Ohio R.R. from originating points in eastern Kentucky on a sliding scale basis with five miles as the unit. The road operates over the Ashland Coal & Iron road for 22 miles east of Ashland, Ky., and at this point a wide range of charges has been in effect. The commission was asked to equalize these rates, and instructed the road to file a tariff based on a sliding scale, as was done some time ago in a western Kentucky coal case.

Pittsburgh, Penn.—Coal dealers in western Pennsylvania, believing that the storage of coal by the Pennsylvania and other railroads is significant of the possibility of labor trouble in the mines next spring, are laying up large quantities themselves. All available storage room the wholesalers have is being filled with various grades of coal for the coal men view with uncertainty the attempts that will be made next April to renew the four-year agreement, that then expires between the producers and the United Mine Workers. The large mining companies are storing millions of tons in an effort to be able to meet the increased demand this winter. More coal is being exported from the country than ever before.

Olympia, Wash.—County Assessor Sams, of Thurston County Washington is contemplating a systematic coal survey of the county. This action is the direct result of the board of equalization, failing to reduce the assessment of the Washington Union Coal Co., of Tono which asked a reduction of $56,000. The case is an interesting one, as the coal company now threatens to sue the county, and it is not definitely known whether the lands of the company contain deposits of any great value or not, although it is generally thought that they do. If the company sues the county, it will be up to the county to show that the lands do contain large deposits, and this will greatly increase the value of the lands to the company, at the expense of the county. The stated object of the survey is to locate other lands that are believed to be valuable.

Pittsburgh, Penn.—By an agreement filed in the United States District Court the opposition which the Pennsylvania R.R. has waged against the Wabash R.R. has ceased. The document which has just been approved by the court provides for a switch connecting the lines of the Pennsylvania with those of the Wabash at a point 11 miles outside this city. By this connection 3,400,000 tons of bituminous coal originating on the Wabash road will have access to the markets reached by the Pennsylvania R.R. Thus has ended a fight of many years, which was begun by the Pennsylvania before the Wabash even got into Pittsburgh and has continued ever since. While the Wabash has had connections for a long time with other roads in this territory, the shippers of coal were not satisfied until their product had an outlet into the Pennsylvania territory.

Anaconda, Mont.—Complete electrification of the Washoe coal mine, belonging to the Anaconda Copper Mining Co. is now under construction. The electric power plant will consist of a 150-kw. turbine generator, the power of which will operate the tipple. Later on, more generators will be installed as the work of electrification nears completion. The company is preparing to embark in the commercial coal business on Oct. 1. Shaker screens of five different sizes are being installed for the following grades of coal: Lump; egg; No. 1 nut; No. 2 nut and slack. Three new bunkers to hold 225 tons are being built for the nut and slack coals, while the old tipple is being reinforced for use in loading the egg and lump coal. Six hundred tons of coal are being mined per day at present, and the increased production from the No. 3 vein, now under development will increase this to 800 tons before winter. Heretofore the Copper company has used its entire product itself, and this will be its first venture into the commercial field with coal.

Coal Trade Reviews

General Review

Fall buying of anthracite opening up. Bituminous feeling the impetus of the improved industrial conditions. Profitable figures on export business. Lake trade shows a gratifying increase. Notably better tone in the Middle West.

Anthracite—The return of householders from summer vacations started coal moving into the consumers' bins, and there is a noticeably better feeling in anthracite circles. Most of the new business has gone to the independent operators at their cut rate figures, but they are now covered with orders close to capacity, and are taking a notably firmer position as regards prices. Moderate concessions will continue the rule until well into the winter, as is always the case, but it is noted that conservative dealers are generally planning to carry full stocks through to Apr. 1, when the new wage scale comes up for consideration. Long-term credits continues to exert an unsettling influence on the market, but the announcement that the new rate decision will not become effective until Dec. 1, has restored confidence of the buyers for the time being.

Bituminous—The bituminous trade is slowly responding to the improved conditions, and there is sufficient business now on hand to keep the accumulations at the loading piers down to a healthy basis. The movement on regular contracts is larger, and manufacturers are showing a disposition to follow the example of some of the larger railroad systems by accumulating surplus stocks. There is less demurrage coal at the distributing centers, and the trade is maintaining an even price level though there is still a slight indication toward heaviness. On the better grades it is generally agreed that they are in a strong position for the balance of the season.

Exports—The off-shore business continues brisk with inquiries plentiful. It is now developing that most of this business is being negotiated at about 10c. per ton above ruling figures on domestic contracts, and generally with the understanding that payment be made before shipment. High ocean freights continue the ruling feature in this branch of the trade. In the coastwise service, quotations on vessel tonnage are nominally unchanged, but are undoubtedly stiffer and susceptible to the least intimation of any general expansion in the demand for vessels.

Lake Markets—There has been a general and decided impetus to the Lake trade, as the end of the season approaches, and it is expected that this will now continue about normal until the close of navigation. Reports from the Northwest are to the effect that coal is moving out to interior points much more freely, and the situation in this department is decidedly more cheerful, though the tonnage for the season will undoubtedly show a heavy loss. Fuel consumption in iron and steel lines in the Pittsburgh district is probably very close to the maximum. The improvement has also spread to the domestic trade, though to a lesser degree. The cool weather has started coal moving out of the retail yards, forcing the dealers into the market, and there is a tendency to buy more freely.

Middle Western—The first half of the current month has witnessed a gratifying expansion of business with renewed activity, and there is a genuine feeling that the market has taken a definite turn for the better. There are quite a few companies that are carrying over some low-priced business from the recent period of depression, while the new advanced circulars have had a tendency to restrict buying, but this is generally regarded as only temporary, and a vigorous demand is expected to develop before the end of the current month. The screenings situation continues to drag, the larger domestic demand having resulted in an increased production of screenings as well. The current market in the Middle West is characterized by a generally close adherence to list prices, and a snappy demand.

A Year Ago—Anthracite trade steadily improving as the season advances. Operations active and the full circular prevails. Bituminous steam trade disappointing in all parts of the country, but operators continue confident as to the future. Market well maintained. Domestic grades beginning to open up as the season advances.

BUSINESS OPINIONS

Boston News Bureau—The sensational position of sterling exchange not only tends to restrict business in exchange, but in all branches of trade save those engaged in producing war munitions. War orders for the allies are being received in such volume that even a loan of $500,000,000 would not restore sterling exchange to the normal. As it is, exchange is accumulating and is being pressed for sale on a market where there is no demand of consequence. Few men are found who are willing to predict the course of trade or prices the next few months. Money is becoming so abundant that the banking element is extremely confused as to how to invest its idle surplus. We are still dominated by war developments. Fundamental conditions could hardly be more encouraging. We are rich in money and products and these resources must finally restore confidence. The present resting spell may prove beneficial.

Iron Age—A significant turn in the steel trade is the beginning of rail orders for spring rolling. The Louisville & Nashville has bought 43,000 tons from the Steel Corporation and the Atlantic Coast Line 20,000 tons for such delivery. The New York Central Lines are taking up their next year's requirements, and an Eastern road is figuring on rollings before winter for rails it will lay in the spring. The steel industry is makink new production records. In August the Steel Corporation produced more ingots than in any other month. Its statement of unfilled orders is expected to show an increase for August, but only a moderate one in view of the large amount worked off in the month.

American Wool and Cotton Reporter—Waiting for the London sales to open and also for word in regard to the embargo on crossbred wools largely influenced the course of the wool market last week. Partly owing to the week-end holiday there was less activity than usual. As a limited quantity of crossbred wools may be exported from London, it is expected that some of these will arrive in the American market within a few weeks.

Marshall Field & Co.—Improvement and better feeling have been apparent in dry goods trading during the week, due in part to more seasonable weather for retail selling and for the maturing of crops. Wholesale shipments have about equaled the unusually heavy distribution of the corresponding week a year ago. More retailers have visited the market, and collections are normal. Our retail sales this week have been especially heavy.

Dry Goods Economist—Importers are naturally gratified at the action of the British Government in permitting the shipment to this country of all goods bought or contracted for by American firms from German and Austrian houses prior to Mar. 1 last.

Bradstreet—Growth in trade and in leading industries is of a cumulative character. Misgivings as to the future seem to have practically disappeared, and though there are some unsettling factors, such as the very weak condition of foreign exchange and the fickleness of labor, the general tendency is onward and upward. This week's chief stimulus to trade is furnished by fall festivals, by visits of country merchants to the larger centers, improvement in house trade, larger road orders, rather freer orders for fall delivery, and by still geater activity in the steel industry.

Dun—Restraint upon new enterprise slackens as international diplomatic relations improve, but the derangement of foreign exchange continues a distrubing element in financial and export circles. Depreciation of European funds in this market has reached the stage where interference with oversea trade is threatened, although no actual check to merchandise shipments has thus far occurred. Important problems, however, are diminishing in number and there is a growing belief that current business progress will not be seriously impeded. Even the notable revival of activity in some directions is less impressive than the general restoration of confidence, without which a return of full prosperity would not be possible.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River have become generally firm, with only light accumulations. An optimistic feeling is now generally apparent. Georges Creek unchanged but Pennsylvania grades show slight improvement. Anthracite begins to move to the consumer and wholesale trade is looking up.

Bituminous—Practically no shading has been reported on the standard grades and all the important shippers have such an amount of business in hand that accumulations of coal at the loading piers are relatively small. The export trade is steadily improving and the balance of 1915 will probably show the record tonnage for foreign clearances. A few of the agencies are accepting what little spot business offers at $2.85 f.o.b. for coastwise delivery, but not so much because they need business as to keep in touch with New England buyers.

Little is heard about possible proposals on the Boston & Maine R.R. contract. This particular order has been held for several years by interests shipping via Norfolk but not from the Pocahontas or New River fields. It would be a sizable order for any shipper to lose and it will be decidedly interesting to see whether this tonnage stays where it is or whether the order is awarded to interests that ship over the Western Maryland or the Baltimore & Ohio.

Full contract figures are being realized for what Georges Creek reaches this territory. The tonnage continues small, with loading at Baltimore still subject to the claims of foreign bottoms for preference in loading.

Only a hand to mouth business is being done by the shippers of Pennsylvania grades. Inquiry is slightly improved, but not enough to make prices any firmer. The minimum range still obtains, but less coal is on demurrage at the loading piers and fewer sacrifice sales are reported. A fair amount of tonnage is coming to this territory in conjunction with anthracite in barges from Philadelphia.

Water Freights—While coastwise rates are nominally unchanged, the market is very susceptible to the least intimation of any charter demand; 75@80c. is the prevailing rate to Boston from Hampton Roads, but quotations to points other than Boston, Providence, or Portland are rather higher than the usual differential calls for. Bangor charters are ordinarily to be had for 15c. up from the Boston rate, but recent charters have been made at $1@1.10.

Anthracite—The companies appear to be moderately well supplied with orders for the present. Retail demand has started up throughout New England and shipments that were to be withheld are now required as promptly as possible. Some of the more conservative dealers are frankly pursuing the policy of keeping a full stock throughout the fall and winter. While receipts during the summer were somewhat lighter than in 1914 it is predicted now that the fall months will more than make up for any deficit.

Bituminous prices at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.90@1.40	$1.15@1.65	$1.67@1.77	
Philadelphia*	2.15@2.65	2.40@2.90	2.92@3.02	
New York*	2.45@2.95	2.70@3.20	3.22@3.32	
Baltimore*	.....	.....	2.85@2.95	
Hampton Roads*	.....	.....	.....	$2.80@2.85
Boston†	.....	.....	.....	3.58@3.78
Providence†	.....	.....	.....	3.50@3.73

*f.o.b. †On cars.

NEW YORK

Better feeling in anthracite circles. Many new orders received. Improvement in line trade. Bituminous situation encouraging. Contract holders taking full quota. Railroads continue to store.

Anthracite—A slightly better feeling exists in the anthracite trade. Dealers are receiving many new orders, some for immediate delivery, and there has been a noticeable improvement.

The announcement from Washington that the Interstate Commerce Commission had extended until Dec. 1, the time for putting into effect the new rates and orders affecting a change in the transporting of hard coal, had a quieting effect on the trade. Wholesalers now feel they can go ahead on a safe basis for at least a few months.

With the passing of Labor Day and the practical ending of the vacation season many householders will return to their winter homes within a short time. This will enable retailers to fill many empty bins. While they have plenty of coal on hand to care for these orders the diminishing of stocks will cause them to place new orders and this will mean an improvement in the general situation.

More improvement has been noticed in the line trade than at tidewater. There has been an increase along Long Island Sound and in New England. The mines worked about four days this week but a better working schedule may be expected shortly.

Demand for the various sizes show little change. Egg and stove are in fair demand but there is a surplus of chestnut. The steam sizes are dull. Pea coal continues plentiful, as is also No. 1 buckwheat. Nos. 2 and 3 buckwheat, of the better grades, are practically out of the market.

Current quotations follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5 05		$5.10	
Egg	5.30	$4.80@5.30	5.35	$4.90@5.35
Stove	5.30	4.80@5.30	5.35	4.90@5.35
Chestnut	5.55	5.00@5.55	5.60	5.10@5.60
Pea	3.50	3.25@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.25@2.75	2.80	2.25@2.80
Rice	2.25	1.75@2.25	2.30	2.00@2.30
Barley	1.75	1.45@1.75	1.80	1.75@1.80

Bituminous—Interest in the bituminous trade is concentrated on the opening of bids for furnishing from 500,000 to 600,000 tons of coal for the Panama R.R. Many dealers take the prices made on this business as a basis for next year's contracts (see contract 1327, p. 446).

While large consumers continue to take better tonnages on their contracts, spot coal demand shows no improvement. There is a well-defined belief that the coming fall and winter will see a shortage of supply and some manufacturers who permitted their stock piles to dwindle are making inquiries. The railroads who are good barometers continue to place large orders for storage purposes. Shippers, as a rule, are sending full quotas on contracts. Fears of a serious car shortage and the prospects of labor trouble in the spring are increasing among the trade.

Prices remain about the same as a week ago. There have been slight changes in quotations but these were not permanent. The gas-coal situation has improved considerably. Exporters report good business with many new inquiries being received.

Current quotations are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	2.90@3.00	2.90@3.00	2.90@3.00	1.35@1.45
Clearfield:				
Medium	2.65@2.80	2.55@2.65	.....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	.....	1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05	.....	.....	1.35@1.50
Nanty Glo	2.75@2.80	.....	.....	1.20@1.25
Barnesboro	2.65@2.70	.....	.....	1.10@1.15
Somerset County:				
Quemahoning	.....	2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55	.....	.....	.90@1.00
Greensburg	2.75@2.80	.....	.....	1.10@1.15
Westmoreland	3.15@3.20	.....	.....	1.35@1.45
West Virginia Fairmont		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run		2.45@2.55	2.45@2.55	.75@ .85
Steam		2.45@2.50	2.45@2.50	.90@ .95
Western Maryland		2.35@2.40	2.35@2.40	.85@ .90

PHILADELPHIA

Anthracite shows fair improvement. Pea coal stronger but chestnut continues weak. Other sizes slightly off circular, but the outlook is more favorable. Bituminous picking up slowly. Short labor and car supply interfering with shipments.

Anthracite—The slight improvement recorded last week continues. All companies report a fair increase in orders, due probably to the recent very cool weather. One of the largest retail companies put on forty extra teams in one day. Of course this was only temporary, but it goes to show that with the first touch of cold weather the people are compelled to order coal on account of very little having been stored so far. Unless all signs fail, September is going to be up to the average or better.

Most of this increased business has gone to the individuals, who still have prices low enough to attract the greater portion of the trade. However, there is no doubt that this condition will change from now on, as the small shippers are practically up to their capacity and when the heavy demand begins the dealers will turn to the large companies. Price cutting by the individuals may be continued long into the fall, even though it should only be from ten to fifteen cents a ton; however, this is all dependent on climatic conditions. It is expected, too, that late in the year any limited price cutting would be of small effect and the dealers will then no doubt

be tying themselves up with the largest shippers in order to avoid any risk of depleted stocks and a possibility of paying premiums when the rush comes about.

It has recently come to light that considerable August coal was bought subject to November billing. It was hoped that the market had seen the last of the long-time credits which have been a feature for many months, for they do not create a healthy condition by any means, as some shippers are sure to learn to their sorrow. It is certainly going to be a difficult matter to get the trade back on a 30- or even 60-day basis.

Pea continues to strengthen slightly and the very low prices of the past several months are only history now. The larger companies, who claim not to have sold any lower than $2 have stated to their customers that they cannot promise shipments at this price beyond the present month, and it would not be at all surprising if $2.25 were asked before the close of next month. There appears to be a concerted effort to get pea back to the position where it is felt it should be as compared with the price of prepared coal. Chestnut continues to cause anxiety with scarcely any tonnage moving into the yards of the dealers.

The prices of the leading companies, according to the September circular, to which the state tax of 2½% must be added, are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.25	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—The bituminous trade is beginning to respond to the improved business conditions. There is no rush, but fair orders are being received and a good many of the shippers report full-time operations at the mines. Labor shortage is acting as a slight deterent, and the current week also showed a car shortage in certain of the mining districts, especially on the lines of the B. & O. Shippers are reporting a good tonnage to the lake district.

Export business continues brisk, with inquiries very plentiful and vessel tonnage still short. It has been learned that most of this business is being taken at about ten cents a ton higher than the domestic trade, with the money generally in hand before shipment. The market is quotable as follows:

Georges Creek Big Vein	$1.65@1.75	Fairmont gas, ¾	$1.20@1.30
South Fork Miller Vein	1.50@1.60	Fairmont gas, mine-run	1.05@1.15
Clearfield (ordinary)	1.00@1.20	Fairmont gas, slack	.70@ .80
Somerset (ordinary)	1.00@1.15	Fairmont lump, ordinary	.90@1.00
West Va. Freeport	.85@ .95	Fairmont mine-run	.85@ .90
		Fairmont slack	.60@ .70

BALTIMORE

Steady improvement to the coal trade. Normal fall conditions about in sight.

Prices are stiffening slowly as the tide of demand is wiping out the surplus production of the mines. Very little low-grade coal is now offering below 80 and 85c. Ordinary coals of Pennsylvania are now bringing from 90c. to $1. Slack, selling recently at 45 to 50c., is now commanding from 65 to 75c. The Baltimore Retail Coal Exchange has set the following fall schedule for the trade: Lykens Valley, No. 2, $8.35; No. 3, $8.60 and nut, $8.60. Sunbury, No. 2, $7.60; No. 3, $7.85, and nut, $8.10. Hard, No. 1, $7.10; No. 2, $7.35; No. 3, 7.60; nut, $7.85, and pea, $5.60.

Exports are holding up well. During August a total of 215,796 tons, valued at $624,389 was loaded here for foreign delivery.

HAMPTON ROADS

Export shipments continue heavy. Little free coal available. Dumpings for month of August amount to 1,561,284 tons.

Coal shipments from Tidewater have been heavy to the foreign markets and there has also been a fair movement coastwise and some government takings. The export movement has been the heaviest to Italy although the largest single cargo of the week went to Cristobal, Canal Zone. Coastwise shipments have gone principally to New England ports with some small cargoes South, and have consisted of high volatile, Pocahontas and New River.

The total dumpings over the three railway piers for August reached the enormous figure of 1,561,284 tons. This is just about one thousand tons below the July movement and is somewhat disappointing as it was expected that the total figures would at least reach 1,600,000 tons. Of the total dumpings the Norfolk & Western handled 790,860 tons, the Chesapeake & Ohio Ry. 467,147 and the Virginian Ry. 303,277 tons. The movement via the Virginian and C. & O. both show an increase over July shipments but there is some falling off in the Norfolk & Western dumpings. The Virginian gain over July figures is only small, but the C. &. O. Ry. showed a decided increase and came within a few thousand tons of making a record for that road.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

Railroad	Week Ending Aug. 7	Aug. 14	Aug. 21	Aug. 28	Sept. 4
Norfolk & Western	135,357	171,252	172,546	211,699	232,334
Chesapeake & Ohio	110,861	83,390	129,826	103,472	82,485
Virginian	64,397	63,066	77,136	82,131	.....
Totals	310,515	317,708	379,508	397,302	.....

Ocean Charters, Clearances and Freights

VESSEL CLEARANCES

The following steamers have cleared from various ports Aug. 27 to Sept. 3:

NORFOLK

Vessel	Destination	Tons
Tatra	Naples	6,636
Carignano	Buenos Aires	3,700
Vesuvio	Genoa	7,100
Nereuse[1]	Gib for orders	6,000
Wimborne[1]	Genoa	8,790
Brighton[2]	Kingston	900
Leonatus[3]	Havana	2,800
Gregory[4]	Para	500
Silvia	Genoa	5,600
Balgray	Dakar	5,300
Ellin[5]	Leghorn	6,993
Carmen[1]	Gib for orders	5,000
Virginia[5]	Bagnoli	5,220
Southwaite[6]	Buenos Aires	4,886
Ulysses	Canal Zone	12,000
Pendleton	Horta, Fayal	711
Genista	Naples	2,793
M. Lawrence	Lisbon	4,100
HERCULES	Gib for Order	6,620
Llanishen	Savona	5,440

NEWPORT NEWS

Vessel	Destination	Tons
Formand	Cardenas	2,045
Kathleen	Montevidoe	4,785
Hans Borge	Havana	2,100
Nolisment	Genoa	7,520
Jata Mendi	Spezia	5,830

NEWPORT NEWS—Continued

Vessel	Destination	Tons
Lolo	Buenos Aires	4,965
Knud II	Port au Spain	2,615
Gantoise		4,520
Trafalgar	Havana	3,200
Southport		5,800

BALTIMORE

Vessel	Destination	Tons
Silverton	Argentina	3,418
Sesostris	Italy	4,848
Titania	Italy	4,589
Georgios	France	4,134
Bendew	Spain	5,655
Gyfarthfa	Brazil	4,199
Hellenio	Sweden	6,200
Constantinos	Argentina	3,689
Pasqualo Lauro	Italy	1,706
Atland	Sweden	6,904
PFimo	Italy	4,300
Patras	Italy	4,508
Veniero	Italy	6,500
St. Theodore	Italy	7,800

[1] Flat Top Fuel Co. [2] Hasler Bros. Inc. [3] New River Coal Co. [4] Chesa. & Ohio C. & C. Co. [5] Pocahontas Fuel Co. [6] Va. Coaling Corp.

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
E.W. Hinkly	Gyayanilla	558	
A. Manning	Boston	870	.80
R.M. Walls	Calais	516	1.35
Hawkins	Yabucoa		4.00
C.K. Klink	Biddeford		1.10
F.A. Allen	Calais		1.30
J. Bohannon	Savannah		1.30

BALTIMORE

Vessel	To	Tons
St. Theodore	Genoa	3,175
Luisa	Valencia	2,345
Primo	Italy	2,220
Bendew	Barcelona[1]	2,305
Atland	Stockholm	2,744
D.N. Luckenbach	Key West	1,851
Avona	Sweden	

[1] Or Valencia.

VIRGINIA

Vessel	To	Tons	Rate
Skogstad	Havana	2,357	
Laertis	River Plate	2,380	8.16
Aldersgate	River Plate	2,364	8.16
Gantoise	River Plate	2,508	
Veerhaven	River Plate	2,007	
Doonholn	Italy	2,777	9.96
A. Stathatos	River Plate	1,749	8.16
Roddam	Montevideo[1]	2,055	7.80
Embiricos	Buenos Aires	1,663	7.92
A.I. Davenport	Rio Grande	952	9.00

[1] Or Buenos Aires.

ATLANTIC RANGE

Vessel	To	Tons	Rate
D. Palmer	Portland	2,331	
G.B. Warren	Sewells Point	1,616	
Maritime	San Fran.	3,598	4.25[1]

[1] Sept. $1.20.

OCEAN FREIGHTS

There has been very little change in the freight market during the past week, and although we chartered a number of steamers for export coal they were all at or about rates recently quoted. We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana	$2.50@3.00	Bermuda	$3.00
Cardenas or Sagua	2.75@3.50	Vera Cruz	3.50@3.75
Cienfuegos	3.25@3.50	Tampico	3.50@3.75
Port au Spain, Trinidad	3.75	Rio	8.04@8.16
St. Lucia	3.50@3.75	Santos*	8.16@8.50
St. Thomas	3.00@3.25	Montevideo	8.04
Barbados	3.75	Buenos Aires or La Plata†	8.04@8.16
Kingston	2.75@3.25	Rosario	8.40
Curacao	3.25	West Coast of Italy	9.84@10.08
Santiago	2.75@3.25	Barcelona**	9.12@9.60
Guantanamo	2.75@3.25	Valparaiso or Callao	7.00
Demerara	4.50@5.00	Marseilles	9.36@9.60

Note—Rates noted in **bold face** type are only approximate.
* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.
W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge. 24c. per net register ton per day demurrage."

LAKE MARKETS

PITTSBURGH

Heavier Lake movement and demand better in other quarters. Operations increased and now between 60 and 70%. Prices firmly maintained.

There has been a decided increase in the Lake movement and expectations are entertained that from now to the end of the season the movement will be practically normal, though even this will make a low total for the season. The ore trade has livened up in remarkable manner. The August ore movement was by far the best of the season and the prediction is made that shipments from Sept. 1 to the end of the season will be equal to the record for that period.

The iron and steel industry has increased its consumption of coal somewhat and consumption in this direction is probably equal to the best rate ever reached. There has been a slight increase in the requirements of other industries. Railroads are also taking somwhat more coal. Retailers are beginning to stock for the regular fall movement but shipments to retailers are thus far not very heavy.

Mine operations in the Pittsburgh district are between 60 and 70% of capacity, probably nearer the higher figure, and somewhat heavier operations are likely in the next two months.

Prices for free coal are quite firmly maintained as follows: Slack, 50@60c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. On contracts to Apr. 1 the market is firm as follows: Slack, 85@95c.; mine-run, $1.15; ¾-in., $1.25; 1¼-in., $1.35.

BUFFALO

Fairly good reports in bituminous. Tonnage increasing. Prospects good for active fall trade. Dealers eager for better movement. Stir in anthracite should begin soon.

Bituminous—Shippers are somewhat puzzled over the increased demand. They agree that it has increased, but it comes so irregularly that it is hard to estimate. There is at least improvement enough to cut out all the very low-priced coal of the earlier part of the year. Slack is stronger and is now back to its old price of about 35c. lower than Pittsburgh mine-run, where it will no doubt stay till after the Lakes close. The Lake trade, when in active condition, turns out a large amount of slack, on account of the shipping of so much three-quarter, but the Lake trade has been dull lately, so that slack should be strong in December.

There is no further report of coal-car shortage, but it is sure to happen as soon as the crops begin to move. The roads have already withdrawn their gondola cars mostly from the coal trade, as they are primarily intended for carrying iron and steel. Some of the leading Pittsburgh coal companies having made a special fall price for the Buffalo market, which they seldom do, and the following will be the basis till further notice: $2.65 for best Pittsburgh lump, $2.50 for three-quarter, $2.40 for mine-run and $2.05 for slack. Allegheny Valley sizes remain about 25c. below Pittsburgh.

Anthracite—There is a slight stir among the buyers at retail, but the demand is not likely to be at all large for some weeks yet. It requires actual starting of fires to make any impression on most consumers. Reports from beyond Lake Michigan are that buying has begun in a healthy way. Lake shipments of anthracite from this port are mainly dependent on such buying and they have been light. For the week the total was 109,237 tons, for the month of August, 509,935 tons and for the season to September they were 2,290,325 tons. The amount last season to September was 2,778,345 tons. The excess of last season was almost entirely on account of the light shipments last July. It is not likely that the loss will be made up.

Anthracite mines are still running slow and in addition are obliged to stock considerable of their output. It is said that the slow buying is largely on account of the readjustment of freight rates, some idea being that there may be a still further change.

COLUMBUS

A marked improvement is noted in every department of the coal business. Domestic and steam trade both more active. Future prospects are brighter.

The trade is showing a definite improvement in every way. Orders for both steam and domestic sizes are coming in better with the result that prices have stiffened materially. The whole tendency is toward higher levels and the worst of the depression is now believed to be over. There is a more optimistic feeling in coal circles and future prospects are brightening.

Dealers' stocks were not large and when the better demand came these soon dwindled so they were forced to put in orders for large shipments to come forward at once. Comparatively few orders are taken for delivery at a future date. Rural dealers are also experiencing a better demand since the farmers have time to haul their winter's supply. Retail prices are stiff and some small increases have been recorded.

The steam business is more active in every direction. Manufacturing is on a larger scale and fuel reuisitions are gradually increasing. Railroads are also stocking up tonnage to be on the safe side. Steam grades are stronger in price and the tendency is to buy more liberally.

The lake trade is more active as the end of the season approaches. Reports from the Northwest show that the movement off the docks to the interior is larger. Chartering of boats is going on actively and a large tonnage will be moved to the head of the Lakes from this time to the close of navigation. A large percentage of the coal loaded at Ohio Lake ports comes from West Virginia.

Prices in Ohio fields are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.50	$1.50		
Inch and a quarter	1.40	1.40	$1.30	$1.30
Three-quarter inch	1.25	1.25		1.25
Nut	1.15	1.25		1.15
Mine-run	1.05	1.10	1.00	1.05
Nut, pea and slack	.65	.70	.55	.65
Coarse slack	.55	.60	.45	.55

Mines have been working at about the following percentages of full capacity:

	Week Ended					Week Ended			
District	Aug. 14	Aug. 21	Aug. 28	Sept. 11	District	Aug. 14	Aug. 21	Aug. 28	Sept. 11
Hocking	25	30	35	45	Cambridge	30	35	35	40
Jackson	20	20	20	20	Masillon	25	30	50	40
Pomeroy	40	40	45	50	Eastern O.	30	55	55	60
Crooksville	30	30	30	35					
					Average	30	33	34	41

CLEVELAND

Warm weather has somewhat interfered with the retail business. The lake trade will be much heavier by Sept. 15.

The closing down of factories over Labor Day gave the plants two idle days that cut into the demand for coal. The market cleaned up well, however, and prices are the same as they have been for the last two weeks. The receipts over Sunday and Monday were held firmly the few hours offices were open Labor Day.

The retail trade has suffered because of the warmer weather but this is only temporary. Discounts ended on hard coal and coke delivered prior to and paid for on Sept. 1, but not so many people took advantage of these as usually do.

In the Lake trade very little is expected at Lake Erie ports for a week. The mines will hardly get back in full operation before the last of the week and Lake coal will not be forthcoming in quantities until next week. Shipping orders have been received for a large tonnage to be floated, but operators cannct get to this business until about Sept. 15 because of the break in mining operations.

Jobbers are looking for a drop in the prices of fine coals after the middle of the month as the Lakes take practically nothing except three-quarter coal. Most jobbers are buying slack only as they have call for it for this reason.

Quotations to jobbers for shipment are as follows:

	Pocahontas	Youghiogheny	Fairmount	Bergholz	Ohio No. 8
Lump	$3.70			$2.30	
Lump, 6-in.				2.30	
Lump, 1¼-in.				2.10	$2.10@2.15
Lump, ¾-in.		$2.15@2.20	$2.00	2.00	2.00
Egg	3.70			1.95	
Mine run	2.70	2.10@2.15	1.90	1.85	1.80@1.85
Slack		1.55	1.70	1.50	1.50

LOUISVILLE

Improved tone to the market. Buyers in the market for larger tonnages.

The coal market is in much better condition than it has been, and the feeling is generally stronger. Prices have been advancing somewhat, and the buyers are covering their requirements as much as possible on the present price levels, since it is evident that an upward movement is on. Dealers have hesitated to stock up, but recent cool weather, which has stimulated the movement to consumers, has likewise resulted in a better demand from the yard men.

The regular run of Eastern Kentucky coals are selling at $1.60 to $1.75 for block, with egg at $1.25 to $1.30 and nut and slack from 65 to 70c. These prices represent a fair advance as compared with last week, and likewise are significant of a change from a buyer's to a seller's market. Fancy Jellico lump coal is being held around $2 a ton. Western Kentucky coals are also profiting by the improvement.

CINCINNATI

Sluggishness in the domestic market continues. Prices low, and no improvement in sight.

With a firm impression prevailing among retailers, that they can get all the coal they want the domestic market is dull. It is a fact that while dealers stocks are much below normal, they have some coal bought at bargain prices, which is relied on to last them should an unexpected demand develop. Steam consumption is still much below what it should be, also, making the entire market sluggish. The only factor, it seems, which can liven things up is something like a normal fall demand.

COKE

CONNELLSVILLE

Prompt furnace coke low but with limited offerings. Trade trying to develop a price for first-half deliveries. Another byproduct plant. Production slightly increased and shipments slightly decreased.

Sales of prompt furnace coke have continued at $1.60 and there are only very limited offerings at this figure, most operators quoting $1.75. The great question before the coke operators now is the price furnace coke should bring for the first-half of 1916. There have been some tentative inquiries from furnace interests but buyers and sellers are far apart. No bids have been made and it cannot be found that any definite quotations have been put out by operators. With the iron and steel trade so prosperous operators think they should obtain say $2.50 for the first-half, but it is practically out of the question to expect to obtain such a price when prompt coke is $1.60. Sliding scales, based on basic pig iron at valley furnaces, are being discussed. For the balance of this year $2 is mentioned in a general way but negotiation might develop a lower figure.

Andrews & Hitchcock have put in a second blast furnace at Hubbard, Ohio, and prospects are that two or three furnaces in the Shenango Valley will blow in shortly. The La Belle Iron Works, Steubenville, Ohio, which has contemplated building a byproduct coke plant for some time, has let a contract for 96 byproduct ovens, to have an output of about 1000 tons of coke daily. The market is quotable as follows: Prompt furnace, $1.60@1.75; September furnace, $1.75; furnace to Jan. 1, $2; prompt foundry, $2.25@2.60; contract foundry, $2.30@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Aug. 28 at 391,310 tons, an increase of 8,704 tons, and shipments at 388,107 tons, a decrease of 5,521 tons.

Buffalo—There is a good movement, prices holding firm. It does not appear likely that an advance will take place right away, as efforts to secure one do not succeed. Still the iron trade is very active here. Late sales have about taken the local output for the entire year and pig iron has lately advanced. The Buffalo prices of coke remain firm, on the basis of $4.25 for best 72-hr. Connellsville foundry and $3.30 for stock coke.

Chicago—Shippers of furnace and foundry coke are still enjoying a brisk business, and a further advance in prices is expected on spot deliveries very shortly. Byproduct sizes have been quiet during the past week, and gas house coke has not been so strong. Quotations are as follows: Byproduct foundry, $4.90@5.10; byproduct domestic, $4.65@4.75; Connellsville, $4.75@4.90; Wise County, $4.75@5; gas coke, $3.75@3.90.

MIDDLE WESTERN

GENERAL REVIEW

Strengthening seen in all directions. Demand for domestic grades stiffened. Screenings steady in the face of increased production. Anthracite orders in better volume.

Expansion of business and renewed activity has ruled during the closing days of August. There is a genuine feeling that the market is on an upward trend, and at a rapid pace at that. A great many operators in Indiana and Illinois claim that they have enough domestic orders to absorb production of coarse sized coals for the next three or four weeks. Inquiries are abundant; but little cheap coal is offered; the attitude towards contracting at low prices has changed; car shortages are reported more frequent, and some announcements are being made of delivery of cars to mines on a percentage allotment basis.

All domestic sizes have materially stiffened, and shippers are feeling encouraged over the immediate outlook. In some quarters it is reported that the higher prices quoted since the first of the month have slowed up orders the last few days somewhat, but this is considered only temporary in view of the possibilities of car and labor shortages in the near future, and renewed buying of a vigorous kind is expected by the middle of the month.

Industrial plants with heavy output are showing a disposition to increase their stocks. In the case of steel and allied industries, coal consumption is now exceeding the normal amount, and with the evident desire on the part of Western railroads to put coal in storage for future emergencies, the coal operator believes that better times are at hand.

CHICAGO

Mines working better and orders more plentiful. Smokeless more active. Advance in anthracite freights causes no increase in prices as yet.

Mines in southern Illinois are running almost full time, and those in the central district are doing better. It is said some of the Franklin County mines are now three weeks and more behind their orders on certain coarse sizes. Franklin and Williamson County screenings show a tendency to decline due to increased production of major sizes. Considerable fine coal tonnage is reported sold around 55c. Increased orders have been received for Harrisburg steam lump.

Conditions in the Springfield district are showing a steady improvement. The shippers report considerable increased activity with many inquiries, and a fair volume of orders. Springfield domestic lump advanced to $1.65 on Sept. 1. Screenings have gone forward steadily at prices ranging from 60 to 65c.

Orders for Indiana domestic lump have rapidly increased. Sullivan County mines have a surplus of egg and nut sizes which are being sold at from 10 to 15c. per ton under list. Clinton Third and Fifth Vein steam lump shipments have been very quiet. The Indiana retailers are coming into the market rapidly for local domestic coals for stocking purposes, and the difficulty now is to market the small sizes.

Smokeless contracts have been closed recently which had been hanging fire for a number of weeks past, and prior to Sept. 1 there was a brisk flow of orders. Few orders have been booked by smokeless operators for immediate delivery since Aug. 1. Cancellations and suspensions have been frequent for orders given in July with the expectation that the market would stiffen early in August.

Some of the splint operators have notified their customers that Sept. 1 their prices will be advanced, and current quotations will not be protected. This has caused some quickening in orders early this week.

A revival has occurred in Hocking domestic trade. Some of the operators are starting off September with strict adherence to the $1.50 price for 3-in. lump, $1.75 for 6-in. lump, and 1¼-in. lump at $1.35. Strength is exhibited in the small sizes, and fine coal is bringing around 55c. to 65c. Generally prices for Hocking coals are much better maintained than they have been for many months past.

All Kentucky coals are still dull.

Anthracite shows improvement, and so far Chicago representatives have not advised the trade of any advances to equalize the recent increase in freight charges on all-rail coal to Chicago. It is said that dealers are sending in more orders the last few days, which causes some to think that September will make a very good record for shipments.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.60@1.75	$1.50@1.60	$1.45@1.60	$1.35@1.50	$1.45@1.60
Steam lump	....	1.25@1.35	1.15@1 30	1.15@1.25	...
2½ and 3-in. lump	....	....	1.40@1.50	1.15@1.25	1.30@1.35
1¼-in. lump	....	....	1.30@1.35	1.15@1.20	....
Egg	1.45@1.75	1.35@1.50	1.15@1.25	1.05@1.15	1.15@1.25
Nut	1.45@1.75	1.10@1.25	1.00@1.10	.95@1.05	1.00@1.10
No. 1 washed	1.60@1.75	....	1.40@1.50	....	....
No. 2 washed	1.35@1.50	....	1.35@1.40	....	....
No. 1 nut	1.60@1.75	....	....	....	....
No. 2 nut	1.25@1.40	....	....	....	....
Mine-run	1.20@1.25	1.00@1.10	.85@ .95	.90@1.00	.85@1.05
Screenings	.60@ .65	.65@ .75	.65@ .75	.55@ .65	.75@ .80

	Harriburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.50@1.75	$1.35@2.25	$2 00@2.25	$1.75@2.00	$1.40@1.60
1¼-in. lump	1.20@1.35	....	....	....	1.25@1.35
Egg	1.35@1.60	1.25@1.85	1.90@2.25	1.65@2.00	1.35@1.50
Nut	....	1.15@1.50	1.75	1.25@1.40	....
No. 1 nut	1.50@1.60	....	1.40	....	....
No. 2 nut	1.25@1.40	....	....	....	....
Mine-run	1.00@1.10	....	1.25@1.40	1.00@1.25	1.00@1.15
Screenings	.55@ .65	.50@ .70	....	....	.55@ .65

West Virginia splint 4-in. lump, $1.25@1.35; 1¼-in. lump, $1.15@1.20.

ST. LOUIS

Prices advanced though some low-priced contracts are carrying over. Demand strong on domestic grades.

With the first of the month at hand Franklin County domestic lump prices have advanced considerable. Many mines still have orders at lower prices, which were taken last month. The filling of these orders have been delayed on account of the shortage of cars produced by flood conditions in August.

The demand is strong on all grades of standard domestic sizes, while screenings are just a little weaker, with a steady demand. The better grades of DuQuoin coal are in strong demand at from $1.50 to $1.65 per ton mine for domestic 6-in. lump and egg, while screenings are moving freely at 55@60c.

Quotations are as follows:

	Big Muddy	Frank Co.	Carterville	DuQuoin
8-in. lump	$2.25	.....	.....	.....
4-in. lump	2.10	.....	.....	.....
2-in. lump	2.00	.....	.....	.....
6-in. lump	.....	$1.65@$1.75	$1.50@$1.60	$1.50
2x6-in. egg	.....	1.65@ 1.75	1.50@ 1.60	1.50
No. 1 nut	.....	1.60@ 1.75	.....	1.25
No. 2 nut	.....	1.50	.....	.....
No. 1 washed	.....	.....	1.50	.....
No. 2 washed	.....	.....	1.25	.....
No. 3 washed	.....	.....	1.20	.....
No. 4 washed	.....	.....	1.15	.....
No. 5 washed	.....	.....	.70	.....
Screenings	1.00	.....	.50@ .60	.55

Prices quoted above are f.o.b. mine. The rates from mines to St. Louis are: Big Muddy, 70c., Franklin County and Williamson County, 72½c., DuQuoin, 62½c. East St. Louis rates are 35½c. per ton less.

INDIANAPOLIS

Mines have begun to increase output of domestic lump. Buyers looking for lower prices for slack but operators slow to accept lower figures.

The arrival of September put many Indiana mines to making domestic lump, preparatory to the first of the heavy buying by private consumers for the fall and winter season. An attempt was made, it is said, by some operators to start the season off at prices showing some increase over the summer schedule but it was found that other operators were content to sell at the old scale and it is evident that there can scarcely be an advance maintained until cold weather appears.

It is difficult to learn whether any of the operators have accepted the low bids of the buyers of slack but it is known that some of the mines are not disposed to sell at below the cost of production as was done last winter. There is practically no change in the railroad or industrial demand. The movement of domestic grades to schools, public buildings, apartments, etc., is taking on some activity.

PORTLAND

Local prices expected to advance shortly in conformity with the increase announced at mines in Utah and Wyoming. Fair volume of business looked for here the coming fall.

The coal business is quiet, but the outlook is for a fair volume of business in the fall as soon as cooler weather sets in. Coal men find buyers showing little disposition to put supplies in storage and hence they expect that when the cooler weather sets in orders will come briskly.

The mines in Utah and Wyoming announced an advance to $2.75 per ton on lump at the mines, a short time ago, but the retailers here have not yet added the increase. The freight to Portland from the mines in Utah is $4.50 per ton and from Wyoming 25c. less, leaving a margin of about $3 per ton for handling. Washington coal, from the Centralia district, is selling at $6 per ton, retail.

FOREIGN MARKETS

Aug. 27—There is a pronounced absence of business on the coal market and the general demand is unimproved. Quotations are nominally as follows:

Best Welsh steam	Nominal	Best Monmouthshires	$5.76@6.00
Best seconds	Nominal	Seconds	5.28@5.52
Screened	$5.76@6.00	Best Cardiff smalls	4.56@4.80
Best gas coals	5.76@6.00	Cargo smalls	2.88@3.36

The prices for Cardiff Coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of Wharfage.

Freights—Chartering is on a fairly active scale but tonnage is still scarce. Rates are approximately as follows:

Gibraltar	$3.96	Naples	$6.96	St. Vincent	$4.32
Marseilles	6.76	Alexandria	7.44	Rio de Janeiro	5.04
Algiers	5.22	Port Said	7.20	Monte Video	4.80
Genoa	6.96	Las Palmas	4.08	Buenos Aires	5.04

CONTRACT NOTES

Netherlands—There is great demand and agitation for coal. The Netherlands Oversea Trust will now issue licenses for American coal.

Louisville, Ky.—The Alfred Shuck Co. consume about 450 tons of nut and slack coal per year. Deliveries are made by railroad at the rate of 40 tons per month, and they have a storage capacity of 100 tons.

Philadelphia, Penn.—Smedley Bros. Co. at this place consume about 300 tons of bituminous coal per annum. Deliveries are made by railroad and they have a storage capacity of 100 tons. Address Secy. R. L. Hilles, Smedley Bros. Co., Frankford, Philadelphia, Penn.

Paraguay—A dealer in builders supplies in Paraguay informs an American consular officer that he desires to buy foundry and furnace coke. He has been paying $13.51 per ton f.o.b. Buenos Aires, and $20.26 per ton c.i.f. destination. He buys about 300 tons per annum. Correspondence should be in Spanish.

Cincinnati, Ohio—The King Machine Tool Co. uses approximately 750 tons of 1¼-in. screened gas coal. Deliveries are made by railroad. They have a storage capacity of 400 tons and deliveries are made only twice a year. They do not contract. Address Pur. Agt. E. A. Muller, King Machine Tool Co., Clifton Ave., Cincinnati, Ohio.

Louisville, Ky.—The Belknap Hardware & Manufacturing Co. at this place consume about 8000 tons of pea and slack coal per annum. Deliveries are made by railroad at the rate of 100 to 200 tons per week, and they have a storage capacity of 200 tons. Address Pur. Agt. J. N. Hall, Belknap Hardware & Manufacturing Co., Louisville, Ky.

Alliance, Ohio—The contract for furnishing the local schools with coal during the ensuing year has been awarded to **Wright & Zehner** on Hocking ¾-in. at $2.15. Other bids were J. H. Miller & Son, Alliance, Pittsburgh No. 8 lump at $2.25; E. M. Lincke, Alliance, Bergholz ¾-in. coal at $2.15; I. G. Tolerton & Son, for Pittsburgh No. 8. ¾ in. at $2.30.

Madison, Wis.—Contract of the Northern Electric Works of the General Electric Co. at Madison, Wis., for 1200 tons of screenings annually, and for 1500 tons of screenings annually consumed by the Edison Lamp Works of the General Electric Co. at Fort Wayne, Ind., has been awarded to the **Consolidated Indiana Coal Co.** on Argyle, W. Va., screenings, at a price of 75c. per ton f.o.b. mines. Address Purch. Agt. Geo. F. Hinman, General Electric Co., Schenectady, N. Y.

Russia—For small parcels, not contraband, Tornea-Bergen is the best route for exports from Russia; for large consignments, Archangel-New York. Fourteen days is the time for the regular service. The steamers of the Russian American Line sail every 11 days. Train connections in Russia are uncertain.

Oklahoma City, Okla.—The coal contracts for the Oklahoma state institutions have been let as follows: State University, Norman, 500 tons mine-run, at $3.14, to **M. B. Schofield & Co.**; School for the Deaf, Sulphur, 250 tons, mine-run, $2.25, **McAlester Fuel Co.**; Hospital for Insane, Norman, 550 tons, mine-run, $3.10, **National Fuel Co.**, and 950 tons, commercial lump, $3.90, **McAlester Fuel Co.**; School of Mines, Wilburton, 800 tons, mine-run, $2.25, **S. J. Katigan;** Colored Agricultural and Normal University, Langston, delivery to be made at Coyle, 800 tons, mine-run, $3.10, **McAlester Fuel Co.;** Institute for Feeble Minded, Enid, 500 tons, mine-run, $2.89, **M. B. Schofield;** Deaf, Blind and Orphan Asylum, Taft, 250 tons, mine-run, $2.40, **M. B. Schofield;** Girls' College, Chickasha, 120 tons, mine-run, and 80 tons nut, $3.40, **McAlester Fuel Co.;** East Central State Normal, Ada, 150 tons, mine-run, $2.57, **Fidelity Fuel Co.;** Northeastern State Normal, Tahlequah, 250 tons, mine-run, $3.30, **McAlester Fuel Co.;** Southwestern State Normal School, Weatherford, 508 tons, mine-run, $3.40, **Fidelity Fuel Co.;** Northwestern State Normal School, Alva, 250 tons, mine-run, $3.34, **M. B. Schofield;** Southeastern State Normal School, Durant, 250 tons, mine-run, $2.66, **McAlester Fuel Co.;** University Preparatory School, Tonkawa, 250 tons, mine-run, $3.09, **M. B. Schofield;** Eastern Oklahoma Hospital for Insane, Vinita, 1500 tons, mine-run, $2.75; **Catale Coal Co.;** Oklahoma State Home, Pryor, 120 tons, mine-run, $2.48, **M. B. Schofield;** Confederate State Home, Ardmore, 250 tons, mine-run, $3.30, **W. E. Beatty;** State Training School, Pauls Valley, 250 tons, mine-run, $3.05, **J. W. Hinton,** Dewar; State Hospital for Insane, Fort Supply, 2500 tons, mine-run, a carload trial order to be submitted by McAlester Fuel Co. at $4.36, M. B. Schofield at $3.59, J. W. Hinton at $3.95 and Fidelity Fuel Co. at $4.38.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

For the official advertisements of bids wanted see the Contracts-to-Be-Let Section on Page 16.

✚Indicates contracts regarding which official information has been received.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

1044—Kansas City, Mo.—The Sewell Paint & Glass Co. will continue buying in the open market on this contract (p. 116), but are still looking for a favorable opportunity to cover their requirements. Address Purchasing Agent, The Sewell Paint & Glass Co., Kansas City, Mo.

1180—Columbia, Mo.—Bids were received on this contract (p. 244), which provided for furnishing the local Water and Light Department with approximately 8,000 tons of washed Nos. 3, 4 and 5 slack coal until 7:30 p.m., Sept 7. The contract becomes effective Sept. 12, and expires Sept. 1 of next year. Certified checks for $500 were required with each bid. Address City Clk. John S. Bicknell, Columbia, Mo.

1263—New Orleans, La.—It is understood that the Crescent City Stock Yards & Slaughter House Co. have already concluded arrangements for their coal on this contract (p. 324). Address Pur. Agt., Crescent City Stock Yards & Slaughter House Co., New Orleans, La.

1326—Dalton, Ohio—Bids have been received on this contract (p. 367), which provides for furnishing the fuel requirements for the Board of Education of Sugarcreek Township (p. 367), from John Caldwell, at $3.10 per ton, and E. P. Gerber, $3.25. These are the minimum figures, the prices going upward according to the length of the haul. Address Clk. Clayton L. Arnolud, Bd. of County Comrs., Dalton, Ohio.

1327—New York, N. Y.—Bids on this contract (p. 367), which provides for furnishing all or any part of the Panama R.R. Co.'s fuel requirements, estimated at from 500,000 to 600,000 tons of the best quality, semi-bituminous mine-run coal, were received, as follows:

Bidder	Tonnage	Price	Name	Delivery Point
J. W. Weaver & Co.	500,000	$2.60	"B" or "Miller Vein"	Philadelphia
B. Nicoll & Co.	500,000	2.50	"Belmont"	Newport News
B. Nicoll & Co.	50,000	2.60	"Cambria Smokeless"	Philadelphia
		2.53	"Cambria Smokeless"	Baltimore
New River Coal Co.	100,000	2.85	"New River Steam"	Sewalls Point
Corona Coal & Iron Co.	100,000	3.85	"Corona"	Mobile, Ala.
Archibald McNeil & Sons Co.	100,000	2.89	"New River"	Newport News
Central Coal & Coke Co.	200,000	4.25	"Arkansas Semi-Anthracite"	Port Arthur, Tex
W. C. Atwater	500,000[1]			
	300,000	2.60	"W.C.A. Pocahontas	Norfolk
	300,000	2.64	Semi-Bitu. Steam"	Lambert's Pt.
Crozer-Pocahontas Co.	100,000	2.60	"Pocahontas" or "No. 3 Vein"	Lambert's Pt.
C. G. Blake Co.	120,000	2.75	"Blake New River Smokeless"	Hampton Roads.
Willard Brothers	100,000[2]	2.84	"New River"	Newport News or Lambert's Pt.
Castner, Curran & Bullitt	600,000	2.90	"C.C.B. Pocahontas" "C.C.B. New River"	Hampton Roads
Chesapeake & Ohio C & C Co.	180,000	2.74	"Admiralty New River Smokeless"	Sewalls Pt. or Newport News
Chesapeake & Ohio C & C Co.	225,000	[3]2.72	"Admiralty New River Smokeless"	Sewalls Pt. or Newport News
Chesapeake & Ohio C & C Co.		[4]2.79	"Admiralty New River Smokeless"	Sewalls Pt. or Newport News
Pocahontas Fuel Co.	600,000	2.85	"Pocahontas" or "New River"	Hampton Roads.

[1] to 600,000 tons. [2] Not more than 10,000 tons a month. [3] 15,000 tons per month. [4] Chesapeake & Ohio Coal & Coke Co. in their second bid of 225,000 tons offered to furnish 15,000 tons per month from Sept. 15, 1915 to Apr. 15, 1916, at $2.72 per to, and 24,000 tons per month from Apr. 15, 1916 to Sept. 15, 1916, at $2.79 per ton.

Address Asst. Pur. Agt. R. E. Rutherford, Panama R.R. Co., 24 State St., New York, N. Y.

New Business

✚**1365—Pittston, Penn.**—Bids will be received by the School Board until 8:15 p.m., Sept. 14, for furnishing and delivering fresh-mined coal for the school term of 1915-1916. Bids to be submitted on all sizes and certified check for $100 payable to the School Board for faithful performance of contract to be furnished. Address Secy. James A. Joyce, Bd. of School Dirs., Pittston, Penn.

1366—Chisholm, Minn.—Bids were received until 8:30 p.m., Sept. 8, for furnishing the Independent School District No. 40 with approximately 2,000 tons of Pocahontas mine-run coal, to be delivered in carload lots at the High and Lincoln School, 225 tons of Youghiogheny screened lump steam coal to be delivered in bins in carload lots at Myers, Shenango and Monroe schools, and some additional small tonnages. A certified check for 5% of the total amount of the bids must accompany all proposals. Address Clk. M. Tripp, Independent School Dist., Chisholm, Minn.

1367—Springfield, Mo.—The County Government will soon advertise for bids to furnish the court house, county jail and almshouse with coal during the ensuing year. About 50 cars will be required. The present contract has been held by the Merchants' Ice & Fuel Co. Address County Clk. John L. Likens, Springfield, Mo.

1368—New Orleans, La.—The St. Charles Hotel, at this place, is requesting bids on their coal requirements for the period from Oct. 1 of the current year, to June 30, of next year. About 3000 tons will be required. The coal will be bought on a heat unit basis. Address Secy. Treas. S. A. Trufant, St. Charles Hotel, New Orleans, La.

1369—West Point, Neb.—Cuming County will receive bids until noon, Sept. 14, for furnishing 50 tons of Hocking Valley dock screened lump coal. Address County Clk. R. Brazda, West Point, Neb.

1370—Newark, N. J.—The State Board of Education will receive bids until noon, Sept. 11, for furnishing 250 gross tons of pea coal for the State Normal School at Newark. Deliveries are to be made as required during the period beginning Sept. 12 and ending Feb. 12 of next year. Address Pres. Joseph S. Frelinghuysen, Dept. of Public Instruction, State House, Trenton, N. J.

1371—New Orleans, La.—The Dixie Brewing Co., at this place, is said to be in the market for its annual contract which will be placed some time during the current month. They consume about 3000 tons of coal a year. Address Pres. Val Mertz, Dixie Brewing Co., New Orleans, La.

1372—Latrobe, Penn.—The School Board of Derry Borough will receive bids until 7 p.m., Sept. 13, for furnishing and delivering Jamison No. 1 grade mine-run coal to the three school buildings of the Borough. Address Pres. J. D. Neely, School Bd. of Derry Borough District, Latrobe, Penn.

1373—Chapel Hill, N. C.—The Blanche Hosiery Mills Co. at this place usually contract some time during September for their annual requirements of coal involving approximately 200 tons of Pocahontas mine-run. They have a storage capacity of 50 tons and deliveries are made by railroad. Address Purchasing Agent, The Blanche Hosiery Mills Co., Chapel Hill, N. C.

1374—Erie, Penn.—Sealed bids will be received for furnishing the Soldiers and Sailors Home with coal during the six months beginning Oct. 1 of the current year and ending Mar. 31 of next year. All proposals must be on forms prescribed, which may be obtained on application. For notice of the contract covering this business for the six months' period beginning Apr. 1 of this year, see "Coal Age," Vol. 7, p. 717. Address Col. John P. Nicholson, Flanders Bldg., 15th and Walnut St., Philadelphia, Penn.

1375—Newton, Iowa—The Newton Lodge No. 1270 B. P. O. E. will receive sealed bids for furnishing the local Post Office Building with coal during the period beginning Oct. 1 of the current year end ending July 1 next year. Bids are requested on mine-run, steam, and lump coal, and should include cost of delivery in the bins at the building. Address Secy. Lee Brown, Newton Lodge No. 1270, B. P. O. E., Newton, Iowa.

+1376—Ankeny, Iowa—The Ankeny Independent School District will receive bids until Sept. 15, for furnishing and delivering coal to the local school building as may be required during the ensuing year. Address Pres. G. E. Goughnour, Independent School Dist., Ankeny, Iowa.

1377—Louisville, Ky.—The coal contract for Levy Bros. at this place, involving about 50 tons of nut and slack coal per month, expires Sept. 28. Delivery is made by wagon. Address Fred C. Levy, Levy Bros., Third and Market St., Louisville, Ky.

+1378—Beaver Falls, Penn.—The Chippewa Township School Board will receive bids for furnishing 175 bu. of coal to be delivered at the four school houses in the township. Address Secy. J. R. Gormley, Chippewa School Bd., Beaver Falls, Penn.

1379—Wheeling, W. Va.—The Board of Education at this place usually contracts some time in October for their annual requirements of coal. The amount involved and price at which the business was done in the past few years was as follows: In 1909, 28,429 bu., at 7½c.; 1910, 34,597, 7⅞c.; 1911, 41,744, 7⅞c.; 1912, 34,097, 9½c. The call for bids is advertised. Address Clk. Frank Stanton, Bd. of Edu., Wheeling, W. Va.

+1380—New Sharon, Iowa—The Independent School District will receive bids until Sept. 13, for furnishing coal as may be required at the local school building during the ensuing year. Address Secy. J. B. Heitsman, New Sharon Independent School Dist., New Sharon, Iowa.

+1381—Chicago Junction, Ohio—The Board of Public Affairs at this place usually contracts about Oct. 1 for their annual requirements of coal involving approximately 2500 tons. The contract last year was let at $2.20 f.o.b. the plant for Pittsburgh No. 8, ¾-in. and Fairmont mine-run. Business is done on competitive bids. Address Clk. E. K. McMorris, Bd. of Pub. Affairs, Chicago Junction, Ohio.

+1382—Birmingham, Ala.—The Municipal Water & Light Department at this place usually contracts about Oct. 1 for their annual requirements of coal. On the current contract 1920 tons of mine-run coal is being used which was bought at $1.20 at the mine. Business is done on competitive bids. Address Supt. W. H. Abernathy, Municipal Water and Light Plant, Birmingham, Ala.

+1383—Miller, S. D.—The Hand County Board of Commissioners received sealed bids until noon, Sept. 7, for furnishing anthracite nut and Hocking Valley coal to be delivered in any part of Miller City as may be required. Address County Audr. D. A. Lewis, Bd. of County Comrs., Hand County, S. D.

1384—Louisville, Ky.—The Atherton Realty Co. will contract some time in October for its annual supply of coal, involving three or four tons per day. It uses nut and slack coal. Address Supt. Sanders, Atherton Realty Co., Atherton Bldg., Louisville, Ky.

+1385—Corydon, Iowa—The County Board of Supervisors will receive bids until 10 a.m., Sept. 13, for furnishing coal required at the Court House and County Home during the coming season. Lump coal is required; that for the court house is to be delivered in the basement and that for the County Home should be on track at Corydon, Iowa. Address County Audr. George S. Moore, Corydon, Iowa.

+1386—Mott, N. D.—The County Government received sealed bids until 2 p.m., Sept. 8, for furnishing 100 tons of lignite coal. The successful bidder will be required to furnish a bond for $200. Address County Audr. E. C. Roberts, Hettinger County, Mott, N. D.

+1387—Missoula, Mont.—The City Government will receive bids until 10 a.m., Sept. 15, for furnishing approximately 75 tons of coal. Address City Clk. L. E. Harris, Missoula, Mont.

+1388—Carlisle, Penn.—The Carlisle School District will receive bids for furnishing approximately 200 tons of bituminous coal to be delivered as required. Bids are to include cost of delivery to the various buildings. Address Chn. C. M. Leggett, Property Com., Carlisle, Penn.

+1389—Yankton, S. D.—The Board of County Commissioners received bids until 2 p.m., Sept. 7, for furnishing the best grade of screened Hocking Valley coal for use at the Court House and Jail during the period beginning with September of this year, up to and including April of next year. Address County Audr. W. O. Nelson, Yankton, S. D.

+1390—Trenton, N. J.—The New Jersey State Hospital will receive bids until Sept. 15 for furnishing coal as may be required during the ensuing year. Address Warden Daniel T. Atchley, New Jersey State Hospital, Trenton, N. J.

1391—Knoxville City, Iowa—The Independent School District of this place will receive bids until 7 p.m., Sept. 13, for furnishing a good grade of merchantable lump coal to be delivered at the three or more school buildings of Knoxville in such quantites that a reasonable supply will be on hand all the time. The successful bidder will be required to furnish a bond for $500. Address Secy. T. G. Gilson, Independent Dist., Knoxville, Iowa.

+1392—Anamosa, Iowa—Sealed bids will be received by Jones County for furnishing approximately 150 tons of Christopher 6-in. lump coal, to be delivered in October and November. Bids will also be received on 30 tons of anthracite range coal. Address County Audr. E. J. Hines, Anamosa, Iowa.

1393—Troy, Ohio—The Miami County Board of Commissioners will receive bids until 2 p.m., Sept. 15, for furnishing approximately 500 tons of 1½-in. screened lump coal, to be delivered at the boiler house on Water St., as may be required, during the period ending Aug. 1 of next year. Bids will also be received for furnishing 500 tons of 1-in. screened lump coal, to be delivered in carload lots at the County Infirmary during the same period. All bidders must furnish a certified check for $50. Address County Audr. M. T. Staley, Miami County, Troy, Ohio.

1394—New Castle, Penn.—The County Government will receive bids until noon, Sept. 16, for furnishing coal as may be required at the Court House and County Jail during the coming season. Bids are requested on Pittsburgh 1¼-in. screened coal and deliveries are to be in such quantities as required. Address Clk. James R. Lamoree, County Comr., New Castle, Penn.

+1395—Pinckneyville, Ill.—The Board of Education, District No. 50, will receive bids until Sept. 10 for furnishing coal as may be required during the school year ending June 30, 1916. The successful bidder will be required to furnish a bond for $200. Address Clk. C. H. Roe, Jr., Pinckneyville, Ill.

1396—Beckley, W. Va.—The Board of Education at this place will receive bids for furnishing coal as may be required at the various schoolhouses during the ensuing year. Address Secy. M. R. Jennings, Bd. of Edu., Beckley, W. Va.

1397—Pomeroy, Ohio—The Salisbury Township Board of Education will receive bids until Sept. 11 for furnishing and delivering a good grade of clean lump coal to the various school districts, as follows: Subdistrict No. 1, Silver Run, 300 bu.; No. 2, Long Hollow, 150 bu.; No. 3, Bradbury, 450 bu.; No. 4, Laurel Cliff, 300 bu.; No. 5, Rock Springs, 300 bu.; No. 6, Bull Run, 150 bu.; No. 7 Hiland, 150 bu.; No. 8 Coal Valley, 150 bu.; No. 9 Jacobs, 150 bu.; No. 10 Midway, 150 bu.; No. 11, 150 bu.; No. 12, Bailey Run, 150 bu.; No. 13, Rose Hill, 300 bu.; No. 14, Long Hollow, 150 bu. Prices are to include cost of delivery, which is to be completed before Oct. 15. Address Clk. Leo J. Byrne, Salisbury Township Bd. of Edu., Pomeroy, Ohio.

+1398—Vandergrift, Penn.—The school district of Vandergrift received bids until Sept. 8 for furnishing carload lots of Pittsburgh nut coal or No. 1 coal from the local banks. Address Secy. W. A. Wiggins, Vandergrift School Dist., Vandergrift, Penn.

+1399—Lewiston, Idaho—The County Government will receive bids until 9 a.m., Sept. 13, for furnishing 40 tons of furnace coal, to be delivered at the Court House. Address Clk. R. N. Wright, Lewiston, Idaho.

+1400—Wellsburg, W. Va.—The Wellsburg Board of Education will receive bids until Sept. 14 for furnishing and delivering coal to the various school buildings during the ensuing year, as may be required. Address Secy. J. A. Gist, Bd. of Edu., Wellsburg, W. Va.

1401—New Orleans, La.—The Robert Werk Pressing Cloth Co. is in the market for its annual requirements of coal, aggregating about 300 tons of lump or mine-run. The coal is to be delivered direct to the company's factory. Address Robert Werk, the Robert Werk Co., 2519 St. Philip St., New Orleans, La.

1402—New Lexington, Ohio—The Board of Education at this place will receive bids until noon, Sept. 18, for furnishing from 120 to 160 tons of lump and mine-run coal to be delivered to the local school building during the coming school year. The successful bidder will be required to furnish a bond for $300. Address Clk. J. H. Cookson, Bd. of Edu., New Lexington, Ohio.

1403—Omaha, Neb.—The Board of Education at this place will receive bids until 2 p.m., Sept. 15, for furnishing approximately 8,200 tons of bituminous and 350 tons of anthracite range coal to be delivered to the various school buildings. Bids will also be received for delivery according to districts as provided in the specifications and f.o.b. track. In bituminous the specifications call for lump, nut, mill and slack coal. The specifications are made more elastic this year in

order to enable dealers in different parts of the city to benefit by their proximity to the various schools, to bid. Address Secy. W. T. Bourke, fifth floor, City Hall, Omaha, Neb.

1404—New Orleans, La.—The New Orleans Cotton Exchange is said to be in the market for their winter's supply of coal. Address Chn. Chaffee, New Orleans Cotton Exchange, New Orleans, La.

1405—Baltimore, Md.—The Shawinnigan Electro Products Co. at this place are now in the market for the fuel supply for a new plant they are completing and expect to put in operation about Nov. 1. Approximately 6,000 tons of anthracite steam sizes will be required. Address Purchasing Agent, The Shawinigan Electro Products Co., Baltimore, Md.

1406—Ogden, Iowa—The Independent School District of this place received bids until 5 p.m., Sept. 10, for furnishing the best grade of lump and mine-run coal to be delivered in car load lots at the school buildings during the coming school year. Address Clerk, Bd. of Edu., Independent School Dist., Ogden, Iowa.

1407—Augusta, Ga.—The City Government received bids until 5 p.m., Sept. 7, for furnishing the coal required during the year beginning Oct. 1. Bids were requested on Jelico coal in half-ton, ton and carload lots, on blacksmith coal in half-ton and ton lots, on nut, egg and furnace coal in half-ton and ton lots and on carload lots of steam coal. Address Clk. Wm. Lyon Martin, Finance Com., City Council, Augusta, Ga.

1408—Antigo, Wis.—The Board of Education at this place received bids until Sept. 8 for furnishing and delivering 200 tons of Miller Creek and 200 tons of white ash coal as may be required during the ensuing year. Address Clk. A. F. Zimmerman, Bd. of Edu., Antigo, Wis.

1409—Philadelphia, Penn.—The Philadelphia County Prison will receive bids until Sept. 14 for furnishing 600 tons of anthracite buckwheat coal to be delivered during October, November and December. Address Philadelphia County Prison, 10th and Reed Sts., Philadelphia, Penn.

1410—Minneapolis, Minn.—The Board of Charities and Corrections will receive bids until 2 p.m., Sept. 14, for furnishing approximately 5,000 tons of Youghiogheny or other bituminous screenings for use at the Minneapolis City Hospital during the period ending Apr. 1. All bids must be accompanied by a certified check for 5% of the amount of the bids. Specifications are on file. Address Secy. Richard Tattersfield, Bd. of Charities and Corrections, City Hospital, Minneapolis, Minn.

1411—Youngstown, Ohio—The Public Service Department will receive bids until noon, Sept. 14, for furnishing approximately 800 tons of coal to be delivered in the basement of the new city hall. Specifications and blank forms may be had on application. All bids must be accompanied by a certified check for $200. Address Clk. H. C. Fox, Pub. Service, Youngstown, Ohio.

1412—Toulon, Ill.—Bids will be received until 10 a.m., Sept. 14, for furnishing the Stark County Poor House, Court House and jail with coal as may be required during the ensuing year. Address County Clk. W. E. Nixon, Stark County, Toulon, Ill.

✚1413—Valentine, Neb.—Bids will be received by Cherry County until noon, Sept. 13, for furnishing three carloads of coal to be delivered in the basement of the Court House. Address County Clk. A. B. Green, Court House, Valentine, Neb.

1414—Granite City, Ill.—The Corn Products Refining Co. will contract some time about Sept. 20 for their fuel requirements until Apr. 1 of next year. About 35,000 tons of Illinois 1-in. and 2-in. screenings will be required. Address Pur. Agt. S. J. Petit, 213-217 Illinois St., Chicago, Ill.

✚1415—New York, N. Y.—Sealed bids will be received until noon, Sept. 17, for furnishing approximately 3000 gross tons of buckwheat No. 1, for the Bellevue and Allied Hospitals. Address Central Purchasing Committee, Room 1226, Municipal Bldg., New York, N. Y.

✚1416—Ely, Minn.—The Independent School District No. 12 will receive bids until 8 p.m., Sept 14, for supplying approximately 600 tons of bituminous coal during the next year. Address Secy. Arthur Toms, School Dist. No. 12, Ely, Minn.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

1094—Fairfield, Iowa—This contract (p. 117), which provides for furnishing the Independent school district at this place with approximately 1,200 bu. of coal during the ensuing year, has been awarded to **S. A. Power.** Address Secy. J. W. Dole, Independent School Dist., Fairfield, Iowa.

✚1097—Norwalk, Conn.—This contract (p. 157), which provides for furnishing Board of Education at this place with approximately 100 tons of anthracite and bituminous coal, has been awarded to **Harris & Gans.** Address Board of Education, Norwalk, Conn.

✚1122—West New York, N. J.—This contract (p. 158), which provides for furnishing the Board of Education with 400 tons of pea and 200 tons of nut coal, has been awarded to the **Consumers Coal Co.,** at $4.14 per ton for pea, and $4.91 for nut. Address Board of Education, West New York, N. J.

1123—Indianapolis, Ind.—This contract (p. 158), which provides for furnishing the Indiana State School for Deaf with approximately 4000 tons of 1¼-in. standard screenings or washed coal and about 40 tons of nut, has been awarded to **A. B. Meyer & Co.** at $1.39 per ton, for Indiana No. 4 Vein coal. Other bids on this business were: Vandalia Coal Co., Indiana No. 4 Vein, $1.45; Indian Creek Mining Co., Indiana No. 5 Vein, $1.35; A. B. Meyer & Co., Washed Nos. 3, 4, 5, $1.79; Vandalia Coal Co., Indiana 5 and 6 Vein, 1¼-in. $1.30. The Manhattan range coal from Ohio was bought at $4.05. Address, Secy. Richard O. Johnson, Bd. of Trustees, Indiana State School for Deaf, 42nd St. & Monon R.R., Indianapolis, Ind.

1126—Hattiesburg, Miss.—This contract (p. 157), which provides for furnishing the local school board with approximately 200 tons of high-grade coal, has been awarded to **Morrison & Co.,** Jackson, Miss., at $2.65 for No. 2 lump coal delivered. Address Supt. F. B. Woodley, 417 Walnut St., Hattiesburg, Miss.

✚1127—Indianapolis, Ind.—This contract (p. 158), which provides for furnishing the local school board with coal requirements during the ensuing year, has been awarded to the **Indianapolis Coal Co.** on the following basis: Linton No. 4, $2.40; Pocahontas mine-run, $3.45; nut and slack, $1.80; Kanawha, $3.65. Address Bus. Dir. John F. Cleland, Bd. of Edu., Indianapolis, Ind.

✚1137—Jefferson City, Mo.—This contract (p. 199), which provides for furnishing the Missouri State Penitentiary with approximately 25,000 tons of coal during the ensuing year, has been awarded to the **Big Muddy Coal & Iron Co.,** of St. Louis at $1.33 per ton at the mine or $3.03 per ton delivered at the penitentiary. The award was let on the following guaranteed analysis: Moisture 7½%; ash, 8%; B.t.u. 13,450. The cost per million B.t.u. amounted to 12.016c. Penalties will be exacted for variations in moisture, ash and heat value lower than the standard specified. While the price per ton is higher than last year, the cost figures out slightly lower upon the specification basis. There were five other bidders on the contract. Address Warden D. C. McClung, Missouri State Penitentiary, Jefferson City, Mo.

✚1139—Marion, Ohio—This contract (p. 199), which provides for furnishing the local School Board with approximately 480 tons of Hocking Valley 3-in. forked coal, has been distributed equally among the **J. L. Price Co., G. W. Paddock** and **P. Malo,** all of whom bid $2.70 per ton. The quotations include cost delivered in bins at the school buildings. Address Clk. Jeanette L. Hutchinson, Marion City Bd. of Edu., Marion, Ohio.

1141—Princeton, Ill.—This contract (p. 199), which provides for furnishing the fuel requirements of the Court House and Jail, has been awarded to **C. A. Oman** at $2.98 per ton for Carterville 6-in. lump delivered at the buildings. Address County Clk. James Fletcher, Bd. of Supervisors, Princeton, Ill.

1142—Sprague, Wash.—This contract (p. 199), which provides for furnishing the local Bd. of Education with coal, has been awarded to the **Potlatch Lumber Co.,** at $5.25 per ton for 70 tons of washed steam and $7.25 per ton for 10 tons of nut coal. Address Clk. J. F. Hall, School Dist. No. 6, Sprague, Wash.

✚1143—Spokane, Wash.—This contract (pp. 199, 283), which provides for furnishing the local Board of Education with coal for the two high schools, has been let to the **Johnson-Bumgay Fuel Co.** and the **Hawkeye Fuel Co.** The former received the contract for furnishing the Lewis & Clark High School with 700 tons of Corbin steam coal at $4.60 per ton, and the latter will furnish the North Central High School with 500 tons of Greenhill steam coal at $4.95 per ton. Experiments are being conducted with a view to using coal in place of wood in some of the grammer schools. Address Secy. E. A. Thomas, Bd. of Edu., Spokane, Wash.

✚No. 1144—Nelsonville, Ohio—This contract (p. 199), which provides for furnishing the local Board of Education with mine-run coal, has been awarded to **J. M. Lama** at $1.09 per ton. Other bids on the contract were Alonzo Coakley, $1.12; John Wion, $1.11; Charles McClurg, $1.18; Thomas Shelton, $1.35; Bennett & Perry, $1.10; Aaron Green, $1.14; Wm. Coakley, $1.14. Address Clk. E. B. Beard, City Bd. of Edu., Nelsonville, Ohio.